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Volume XXV

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Announcement of the Forty-third

Summer Session

1934

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ANNOUNCEMENT OF THE SUMMER SESSION

This pamphlet is designed to give prospective students complete information about the Summer Session of Cornell University. On the last page there is a list of other publications which describe the courses of study offered during the regular academic year by the several colleges and schools of the University.

THE SUMMER SCHOOL OF BIOLOGY

See page 53 for information about the summer courses in Biology to be given at Cornell University in 1934.

THE NEW YORK STATE SUMMER SESSION AT CORNELL UNIVERSITY

See page 59 for information about the summer courses in Agriculture and in Home Economics to be given at Cornell University in 1934.

OFFICE AT GOLDWIN SMITH 252

The office of the Summer Session is in Room 252, Goldwin Smith Hall. The office will be open as a bureau of information on registration day from 9 A. M. till 1 P. M. and from 2 till 5 P. M., and thereafter throughout the session, daily except Saturday from 9 till 12:30 and from 2 till 4.

Members of the staff of instruction may be consulted at the Drill Hall on Monday, July 9.

THE SESSION MUST BEGIN PROMPTLY

In order to get the full number of exercises announced for the session, it is necessary that all work begin promptly on Tuesday morning, July 10. Students are urged to reach Ithaca in time to be present at the first exercise of each class. They should, if possible, register on Monday, July 9; if not, then on Tuesday, July 10, in an hour not occupied by class work.

AUTOMOBILE PERMITS

Any student wishing to operate an automobile during the Summer Session must at the time of registration for courses officially register his car with the Committee on Traffic Control. For this purpose an officer of the University will be present in the registration room. The fee is one dollar. A student wishing to park his car on the Campus must secure a parking permit, paying an additional fee of one dollar.

THE CALENDAR

THE FIRST TEN DAYS

July 9, Monday, 8 A. M.-5 P. M.	Registration, <i>State Drill Hall</i> .
July 10, Tuesday.....	Instruction begins at the time and place announced for each course. Registration is continued at Registrar's office, <i>Morrill Hall</i> .
July 12, Thursday evening.....	Lecture-Recital.
July 13, Friday, until 4 P. M..	Last day for payment of fees at the Treasurer's office, <i>Morrill Hall</i> .
July 15, Sunday, 11 A. M.....	Public Worship and Sermon in <i>Sage Chapel</i> .
July 15, Sunday evening.....	Organ Recital, <i>Bailey Hall</i> .
July 16, Monday evening.....	Lecture Course.

THE REGULAR WEEKLY SCHEDULE

Sunday, 11 A. M.	Public Worship and Sermon, <i>Sage Chapel</i> . (Beginning July 15.)
Sunday evening,	Organ Recital, <i>Bailey Hall</i> , (Beginning July 15.)
Monday evening,	Lecture Course. (Beginning July 16.)
Wednesday evening,	Departmental Lectures and Conferences. (Beginning July 11.)
Thursday evening,	Lecture-Recital. (Beginning July 12.)
Friday evening,	Plays by Summer Theater Company. (Beginning July 13.)
Saturday evening,	Plays by Summer Theater Company. (Beginning July 14.)

THE LAST DAY

August 17, Friday.....	Summer Session ends.
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THE WEEKLY CALENDAR

THE WEEKLY CALENDAR of the University carries announcements of all public exercises held in connection with the Summer Session. It is posted on the bulletin boards.

CORNELL UNIVERSITY

THE SUMMER SESSION OF 1934

OFFICERS

The President of the University

LIVINGSTON FARRAND, A.B., M.D., L.H.D., LL.D.

The Provost of the University

ALBERT RUSSELL MANN, B.S.A., A.M., D.Sc., D.Agr., LL.D.

ADMINISTRATIVE BOARD

Executive Committee

RIVERDA HARDING JORDAN, Ph.D., *Chairman*

BENTON SULLIVAN MONROE, Ph.D., *Secretary*

FLOYD KARKER RICHTMYER, Ph.D., Dean of the Graduate School

DEXTER SIMPSON KIMBALL, D.Sc., LL.D., Dean of the College of Engineering

ROBERT MORRIS OGDEN, Ph.D., Dean of the College of Arts and Sciences

ROLLAND MACLAREN STEWART, Ph.D., Director, New York State Summer Session

The Registrar

EUGENE FRANCIS BRADFORD, Ph.D.

The Dean of Women

R. LOUISE FITCH, A.M.

STAFF OF INSTRUCTION

(The names of the instructors in the New York State Summer Session at Cornell University are printed on pages 62 and 74; those of the instructors in the Summer School of Biology, on page 53; those of the instructors in the Graduate School of Education on page 45.)

RALPH PALMER AGNEW, Ph.D. Mathematics
(Assistant Professor of Mathematics)

DANE LEWIS BALDWIN, M.A. English
(Instructor in English)

JOHN ROBERT BANGS, JR., M.E. Engineering
(Professor of Administrative Engineering and Personal Director of the College of Engineering)

MADISON BENTLEY, Ph.D. Psychology
(Sage Professor of Psychology)

MORRIS GILBERT BISHOP, Ph.D. French
(Assistant Professor of the Romance Languages and Literatures)

SAMUEL LATIMER BOOTHROYD, B.S. Astronomy
(Professor of Astronomy and Geodesy)

JULIAN PLEASANT BRETZ, Ph.D. History
(Professor of American History)

THOMAS ROLAND BRIGGS, Ph.D. Chemistry
(Professor of Physical Chemistry and Electro-Chemistry)

JAMES DABNEY BURFOOT, JR., Ph.D. Geology
(Instructor in Geology)

EARLE NELSON BURROWS, M.C.E. Structural Engineering
(Assistant Professor of Structural Engineering)

WALTER BUCKINGHAM CARVER, Ph.D.	Mathematics
(Professor of Mathematics)	
JOHN MONTGOMERY CLARKSON, Ph.D.	Mathematics
(Instructor in Mathematics)	
JACOB ROLAND COLLINS, Ph.D.	Physics
(Assistant Professor of Physics)	
LOUIS COWLES CONANT, Ph.D.	Geology
(Instructor in Geology)	
GEORGE IRVING DALE, Ph.D.	Spanish
(Professor of Romance Languages)	
ALEXANDER M. DRUMMOND, A.M.	Public Speaking
(Professor of Public Speaking)	
CHARLES LOVE DURHAM, Ph.D., Litt.D.	Latin
(Professor of Latin)	
THEODORE H. EATON, Ph.D.	Rural Education
(Professor of Rural Education)	
PAUL SOPHUS EPSTEIN, Ph.D.	Physics
(Professor of Mathematical Physics, California Institute of Technology)	
JENNETTE EVANS, M.D.	Hygiene
(Assistant Professor of Hygiene and Medical Adviser of Women)	
ALBERT BERNHARDT FAUST, Ph.D.	German
(Professor of German)	
EMERY NELSON FERRISS, Ph.D.	Rural Education
(Professor of Rural Education)	
FRANK H. FINCH, Ph.D.	Education
(Director of Guidance, University High School, University of Minnesota)	
FRANK SAMUEL FREEMAN, Ph.D.	Education
(Assistant Professor of Education)	
LEO GERSHOY, Ph.D.	History
(Associate Professor of History, Long Island University)	
ROSWELL CLIFTON GIBBS, Ph.D.	Physics
(Professor of Physics)	
DAVID CLINTON GILLESPIE, Ph.D.	Mathematics
(Professor of Mathematics)	
GUY EVERETT GRANTHAM, Ph.D.	Physics
(Assistant Professor of Physics)	
ANDREW COMSTOCK HAIGH, A.B.	Music
(Assistant Professor of Music)	
HARLEY EARL HOWE, Ph.D.	Physics
(Assistant Professor of Physics)	
MELVIN LOVELL HULSE, Ph.D.	Education
(Instructor in Education)	
WALLIE ABRAHAM HURWITZ, Ph.D.	Mathematics
(Professor of Mathematics)	
JOHN IRWIN HUTCHINSON, Ph.D.	Mathematics
(Professor of Mathematics)	
JOHN GAMEWELL JENKINS, Ph.D.	Psychology
(Assistant Professor of Psychology)	
EDGAR AUGUSTUS JEROME JOHNSON, Ph.D.	Economics
(Assistant Professor of Economics)	
JOHN RAVEN JOHNSON, Ph.D.	Chemistry
(Professor of Organic Chemistry)	
RIVERDA HARDING JORDAN, Ph.D.	Education
(Professor of Education)	
EARLE HESSE KENNARD, Ph.D.	Physics
(Professor of Physics)	
HORACE KIDGER, A.B., A.M., LL.B.	Social Science
(Head, Department of Social Studies, Newton, Mass., High School)	
MAX LUDWIG WOLFRAM LAISTNER, M.A.	History
(Professor of Ancient History)	

ALBERT WASHINGTON LAUBENGAYER, Ph.D.	Chemistry
(Assistant Professor of Inorganic Chemistry)	
VIVIAN STREETER LAWRENCE, JR., B.S., M.E., Ph.D.	Mathematics
(Assistant Professor of Mathematics)	
GILBERT N. LEWIS, Ph.D., D.Sc.	Chemistry
(Professor of Chemistry, and Dean of the College of Chemistry, University of California)	
HOWARD SCOTT LIDDELL, Ph.D.	Physiology
(Professor of Physiology)	
FREDERICK GEORGE MARCHAM, Ph.D.	English History
(Professor of English History)	
MILTON DAVID MARX, Ph.D.	English
(Instructor in English)	
CLYDE WALTER MASON, Ph.D.	Chemistry
(Assistant Professor of Chemistry)	
JAMES FREDERICK MASON, Ph.D.	French
(Professor of Romance Languages and Literatures)	
BENTON SULLIVAN MONROE, Ph.D.	English
(Professor of English)	
ROYAL EVERT MONTGOMERY, Ph.D.	Economics
(Assistant Professor of Economics)	
CLYDE B. MOORE, Ph.D.	Education
(Professor of Education)	
CHARLES WALTER MORSE, Ph.D.	Chemistry
(Instructor in Chemistry)	
D. E. MURRAY, A.B.	Physical Education
(Director of Physical Education, Madison Junior High School, Rochester, New York)	
CHARLES MERRICK NEVIN, Ph.D.	Geology
(Assistant Professor of Geology)	
MELVIN L. NICHOLS, B.Chem., Ph.D.	Chemistry
(Assistant Professor of Chemistry)	
CLARK SUTHERLAND NORTHUP, Ph.D.	English
(Professor of English and Librarian of the Hart Memorial Library)	
EDWIN NUNGEZER, Ph.D.	English
(Assistant Professor of English)	
ROBERT MORRIS OGDEN, Ph.D.	Education
(Professor of Education and Dean of the College of Arts and Sciences)	
PAUL MARTIN O'LEARY, Ph.D.	Economics
(Assistant Professor of Economics)	
JACOB PAPISH, Ph.D.	Chemistry
(Professor of Chemistry)	
ANDREW PROSPER PELMONT, Ph.D.	French
(Assistant Professor of Romance Languages and Literatures)	
HAROLD CHARLES PERKINS, M.E.	Mechanics
(Assistant Professor of Mechanics of Engineering)	
WILLIAM HOWARD PILLSBURY	Education
(Superintendent of Schools, Schenectady, New York)	
PAUL RUSSEL POPE, Ph.D.	German
(Professor of German)	
ERNEST WILLIAM RETTGER, Ph.D.	Mechanics
(Professor of Mechanics of Engineering)	
HAROLD LYLE REED, Ph.D.	Economics
(Professor of Economics and Finance)	
FRANCIS ROBERT SHARPE, Ph.D.	Mathematics
(Professor of Mathematics)	
HAROLD ROBERT SMART, Ph.D.	Philosophy
(Assistant Professor of Philosophy)	
DEAN FRANKLIN SMILEY, M.D.	Hygiene
(Professor of Hygiene and Medical Adviser)	

STAFF OF INSTRUCTION

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HAROLD D. SMITH, A.B., Mus. D.	Music
(Assistant Professor of Music)	
LLOYD PRESTON SMITH, Ph.D.	Physics
(Assistant Professor of Physics)	
VIRGIL SNYDER, Ph.D.	Mathematics
(Professor of Mathematics)	
WALTER HUTCHINSON STANTON, Ph.D.	Public Speaking
(Assistant Professor of Public Speaking)	
WALTER KING STONE	Drawing and Painting
(Assistant Professor of Drawing)	
RUSSELL McCULLOCH STORY, Ph.D.	Government
(Professor of Political Science, Pomona College)	
EVERETT MILTON STRONG, B.S. in E.E.	Electrical Engineering
(Assistant Professor of Electrical Engineering)	
WILLIAM STRUNK, JR., Ph.D.	English
(Professor of English)	
RALPH COLTON TALLMAN, Ph.D.	Chemistry
(Instructor in Chemistry)	
V. G. TERENTIEFF	Physical Education
(Instructor in Physical Education)	
CHARLES KENNETH THOMAS, Ph.D.	Public Speaking
(Assistant Professor of Public Speaking)	
HAROLD W. THOMPSON, Ph.D., D.Litt., F.S.A.	English
(Professor of English, New York State College for Teachers)	
K. V. THORIN	Physical Education
(Instructor in Physical Education)	
LEONARD CHURCH UROUHART, C.E.	Structural Engineering
(Professor of Structural Engineering)	
OSCAR DIEDERICH VON ENGELN, Ph.D.	Geography and Geology
(Professor of Physical Geography)	
LAWRENCE JENSBY VOSS, M.A.	Public Speaking
(Instructor in Public Speaking)	
RUSSELL HALDERMAN WAGNER, Ph.D.	Public Speaking
(Assistant Professor of Public Speaking)	
KENNETH L. WASHBURN, B. F. A.	Drawing and Painting
(Instructor in Freehand Drawing)	
PAUL J. WEAVER, B.A.	Music
(Professor of Music)	
HARRY PORTER WELD, Ph.D.	Psychology
(Professor of Psychology)	
ARTHUR PRESTON WHITAKER, Ph.D.	History
(Professor of American History)	
ARTHUR LENSON WOHL, Ph.D.	Public Speaking
(Assistant Professor of Speech, Hunter College of the City of New York)	

OBJECT OF THE SESSION

INSTRUCTION ADAPTED TO VARIOUS NEEDS

The primary object of the Summer Session is to advance education by helping those engaged in it. The instruction is adapted to the needs of the following classes:

1. Professors and teachers in colleges and schools, superintendents, and supervisors of special branches of instruction.

The announcements of the different departments show a wide range of work. This work is either advanced and, therefore, suited to specialists who wish to pursue their individual study; or more elementary and adapted to teachers who desire to start in a new field. In addition to the instruction of the classroom, the University's libraries, museums, laboratories, and shops are open for use.

2. College students in Cornell or other universities who wish to make some scholastic use of the long vacation, especially those whose college studies may for one reason or another have been interrupted. Graduates may count some of the courses toward an advanced degree. See the *Announcement of the Graduate School* with regard to opportunities for advanced work and research during the summer.

Undergraduates who are in good standing academically may anticipate requirements and thereby shorten their course, or may make up existing deficiencies. The conditions for receiving credit, and the amount which may be obtained, are stated below, under the head of Academic Credit for Work.

3. Students entering the University and wishing to obtain surplus credit at entrance, or to complete the entrance requirements.

It often happens that students have in June more or less than the requirements for admission to college. The Summer Session affords them the opportunity either to add to their surplus and thus, in some cases, to gain a year in time; or to make up their deficiency.

4. All persons qualified to pursue with profit any course given, whether or not they are engaged in formal study or teaching.

ACADEMIC CREDIT FOR WORK

IN THE COLLEGE OF ARTS AND SCIENCES

To obtain credit towards the Cornell A.B. for work done in a Cornell Summer Session, a student must previously have filed with the University Director of Admissions credentials covering the entrance requirements of the College of Arts and Sciences. He should then, in advance of Summer Session registration, secure the Dean's approval of his selection of courses. For work completed in a single Summer Session credit of not less than four nor more than eight hours will be allowed, but a total of not more than thirty hours of credit may be

allowed towards the degree for all summer session work whether done at Cornell or elsewhere. The academic requirements for the degree of Bachelor of Arts are explained in detail in the Announcement of the College of Arts and Sciences.

The Summer Session records of students registered in the College of Arts and Sciences are reviewed by the usual standing committees of the College, and poor records in the Summer Session are liable to the same penalties as in the regular University session.

The foregoing regulations apply to students matriculated at Cornell. Undergraduates enrolled in other institutions and wishing to have credits earned in the Summer Session applied on their work at such other institutions should, before coming to Ithaca, consult their own college authorities and make all arrangements by them deemed necessary. The Cornell Summer Session can assume no responsibility for the use to be made of credits earned by students thus coming from other places of study. The certificates mentioned on page 11 will show what courses have been taken, the amount of credit in terms of Cornell "hours," and the grades.

IN OTHER COLLEGES OF THE UNIVERSITY

The nature and amount of credit allowed in other colleges at Cornell for work in the Summer Session may be learned from the statements under the announcement of each course.

IN THE GRADUATE SCHOOL

A student who wishes to enter the Graduate School must file application for admission in the Office of the Dean of the Graduate School by June 25. Application must be made on the formal blanks obtainable from the office of the Graduate School, and must be accompanied by complete and official transcripts of the student's previous training.

A graduate of any college whose requirements for a first degree are substantially equivalent to those for the first degree at Cornell may be admitted to resident study in the Graduate School. He may at once enter upon candidacy for an advanced degree if he is able to show that he has had adequate preliminary training in the subjects in which he proposes to work. The requirements for the degree do not depend primarily on the completion of any prescribed number of courses or of a fixed term of residence. They are rather based upon actual achievement in scholarship and research in the fields indicated by the major and minor subjects. The writing of a thesis and the passing of a special examination are also required; except that for the degrees of Master of Arts in Education and Master of Science in Education the thesis may be waived in consideration of certain other requirements.

Not all work done by a graduate student is graduate work in the strict sense of the term. Graduate work to be considered acceptable for a degree must be of advanced character in some field or depart-

ment of knowledge. No residence towards a master's degree will be granted any student who does not register with the Dean of the Graduate School within three days after the opening of the Session, and who does not formally become a candidate for this degree under the direction of a special committee; see below. The latest day for such registration in 1934 is July 12.

Students of the University Summer Session, of the Summer School of Biology, and of the New York State Summer Session who have been admitted to candidacy for an advanced degree are required to pay the regular tuition fee of the session, sixty dollars; but see below, page 13. On registering for the first time as candidates, students who have not previously matriculated in Cornell University will pay in addition the regular matriculation fee of ten dollars. See the full statement about tuition and fees in the Graduate School on page 13.

The residence requirements for the Master's degree may be fulfilled in whole or in part by attendance during the Summer Session of the University. For this purpose, two summer sessions will be regarded as the equivalent of one term, and four summer sessions as the equivalent of one year, the minimum period of residence for this degree. Candidates for this degree who are in residence during summer sessions only are also required to continue their studies during the year under the direction of the chairman of the special committee in charge of their work.

The residence requirements for the Doctor's degree may, upon recommendation of the student's special committee, be fulfilled in part by attendance during the Summer Session. For this purpose, two summer sessions will be regarded as the equivalent of one term, and four summer sessions as the equivalent of one year. The last year of required residence must be spent in study during regular sessions at Cornell University.

Any person wishing to become a candidate for an advanced degree and to study during the Summer Session is advised to write to the professor whose work he expects to take, and also to the Dean of the Graduate School, asking for a blank form of application for admission to the Graduate School. It is much better to make these arrangements before coming to Ithaca, thus avoiding delay and interruption of study after the Summer Session has begun. In this way, moreover, it may be possible to secure the advice and guidance of professors in fields of study of which no specific mention is made in the announcements. Not all departments formally offer graduate work. In some departments, notably in the Summer School of Biology, opportunities for research may be had for a longer period than the six weeks during which courses are formally conducted.

Each student, upon entering the Graduate School, must choose a field of study. Within that field, the branch of knowledge to which he intends to devote the larger part of his time is termed his major subject; the other subject or subjects, which will necessarily be more restricted in their scope and which should be selected with reference

to their bearing on the major subject, are termed the minor subjects.

The degrees of Master of Arts in Education and of Master of Science in Education are offered to candidates regularly qualified to enter the Graduate School. These degrees are designed for school executive officers and teachers who do not wish to enter upon the more restricted program of study involving intensive research, or who wish to supplement previous training in order to meet advanced professional requirements for certification. Suggested programs of study for such candidates have been prepared, subject to modification to suit individual needs. Complete information regarding such programs may be obtained by addressing the Director of the Graduate School of Education, Stone Hall, Ithaca, N. Y.

The work of each graduate student who is a candidate for an advanced degree is in charge of a special committee consisting of the teachers under whom his major and minor studies are pursued, a representative of his major subject being chairman. The student is expected to confer freely with the members of his special committee, both in regard to the general plan of his work and in connection with individual courses of study. A student upon registering in the Summer Session with the intention of doing graduate work as a candidate for an advanced degree must also register with the Dean of the Graduate School and present to him a statement of his major and minor subjects approved by the members of his special committee.

In certain departments an invitation is issued to scholars who are beyond the stage of regular graduate study to make use of the resources of the University in these fields for carrying on research.

CERTIFICATES FOR WORK DONE

Students of the Summer Session who are not matriculated in the University may receive certificates of attendance and of work satisfactorily performed. Application for them must be made before August 10, and the applicant must leave at the office of the Registrar a large-sized envelope stamped and directed to his home address. The certificate will then be forwarded by mail. The regulations of each department for the granting of a certificate must be met.

GENERAL INFORMATION

CONDUCT AND SCHOLARSHIP

The Summer Session is conducted under the same general regulations concerning conduct and scholarship as apply during the academic year. For this reason students are requested to familiarize themselves with dormitory and other rules, and to abide by them. The officers of the University also reserve the right to cancel the registration of any student at any time for neglect of scholastic duties. The rules governing student conduct are:

"A student is expected to show both within and without the University unfailing respect for order, morality, personal honor, and the rights of others. The authority to administer this rule and to impose penalties for its violation is vested in the University Committee on Student Conduct. The rule is construed as applicable at all times, in all places, to all students of the University. A student may at any time be removed from the University if, in the opinion of the Committee on Student Conduct, his presence is not conducive to the University's best interests."

ADMISSION

There are no examinations for admission to the Summer Session. Each person must, however, satisfy the instructor in charge of every course he intends to take, unless it be elementary, that he is qualified to pursue the work.

An undergraduate student who is registered in an institution other than Cornell and who wishes to enter the Summer Session must secure from his dean or other competent authority a certificate of good standing. Students on probation and students whose names have been removed from the rolls of the institution are regarded as not in good standing and accordingly are not admitted. A blank form of certificate may be had on application to the Secretary of the Summer Session.

Undergraduate students who are on probation or whose names have been removed from the rolls of any college at Cornell University are not admitted to the Summer Session except upon the recommendation of the college concerned.

Admission to the classrooms during the Summer Session is restricted to students duly registered for the session. A student thus duly registered may occasionally visit any class; but if he wishes to attend regularly without credit he must secure special permission from the Chairman of the Summer Session. Such permission will be granted only when the student can show a serious purpose in such attendance.

If a student entering the Summer Session wishes his work to count toward a degree, there are certain regulations that he must comply with, and he will find them set forth under the head of Academic Credit for Work, page 8.

REGISTRATION

All students of the Summer Session are required to register with the Registrar of the University. For the session of 1934 the registration day is Monday, July 9, the hours 8 a. m. to 5 p. m., the place the State Drill Hall. Students are urged to register on the official opening day. If they reach Ithaca on July 10 or later, they must register at the office of the Registrar in Morrill Hall between 9 a. m. and 4 p. m. Registration before July 9 is not required, and it is useless to apply for registration blanks in advance.

Beginning on Tuesday, July 10, the Registrar's office in Morrill Hall will be open from 9 A. M. till 4 P. M. every week day except Saturday, when it will be closed at noon.

Students who wish to obtain credit for graduate work done during the Summer Session must register not only with the Registrar but also with the Dean of the Graduate School, at the Drill Hall on registration day or thereafter at the Dean's office, 22 Morrill Hall.

Persons who are to take courses in the New York State Summer Session and in any department of the Summer Session of the University must register for both the Summer Session and the New York State Summer Session. They are required to pay only one tuition fee.

TUITION

The charge for tuition in the Summer Session of the University is sixty dollars.

The tuition fee is payable in full, on the first registration day or within the next five days, at the office of the Treasurer, Morrill Hall.

Students in the Graduate School are required to pay fees as follows:

An administration fee of \$12.50 for each term of the academic year; and of \$6.25 for each summer session or for work during the summer under personal direction.

A tuition fee of \$75 for each term of the regular academic year, and of \$30 for each summer session; with the exception that any student undertaking graduate work for the first time at Cornell in a summer session, shall pay a summer session tuition fee of \$60 for such first summer's work, and of \$30 for each subsequent summer session.

No student shall receive the master's degree who has not paid tuition equivalent at least to one academic year, during the academic year, or summer courses, or both; and no one shall receive the doctor's degree who has not paid tuition for the equivalent of at least three academic years, unless one or more of the years spent in study for the doctor's degree shall have been spent in approved graduate study at

another university—but in any event at least the equivalent of one academic year's tuition must be paid while in graduate study at the University.

To be specific, a candidate for the degree of Master of Arts will pay a tuition fee of \$60 (plus an administration fee of \$6.25) for his first summer, and of \$30 (plus an administration fee of \$6.25) for each succeeding summer.

On registering for the first time as a candidate, a student who has not previously matriculated in Cornell University, must pay a matriculation fee of \$10 in addition to any other fees. This fee is not refundable.

If registered during the summer under personal direction students are required to register with the Registrar as well as in the Graduate School and to pay an administration fee of \$6.25.

Students registered under personal direction during the summer who desire residence credit for their work, must pay tuition for the credit desired pro rata at the rate charged for the regular academic year, such payment to admit them to the current summer session classes without additional tuition payments; provided that the amount of tuition paid is at least equal to that charged students registered in the summer session. Students registered under personal direction during the summer, not for credit, are exempt from the payment of tuition, but may not attend either as visitors or for subsequent credit, any of the classes or exercises of the summer session.

Any student who fails to pay his tuition charges, other fees, and other indebtedness to the University, or who if entitled to free tuition, fails to claim it at the Treasurer's office and to pay his fees and other indebtedness, within the prescribed period of grace, is thereby dropped from the University unless the Treasurer has granted him an extension of time to complete payment. The Treasurer is permitted to grant such an extension, when in his judgment, the circumstances of a particular case warrant his doing so. For any such extension the student is assessed a fee of \$5 for the first week and \$2 additional for each subsequent week in which the whole or any part of the debt remains unpaid, but the assessment in any case is not more than \$15. The assessment may be waived in any instance for reasons satisfactory to the Comptroller and the Registrar, when such reasons are set forth in a written statement.

If a student withdraws from the Summer Session, the Treasurer may refund a part of the tuition fee or cancel a part of the obligation that the student has incurred for tuition, provided the reason for the withdrawal be stated in writing and be satisfactory to the Comptroller and the Registrar. In such a case the student is required to pay twenty-five per cent of the term's tuition for each week or fraction of a week between the first registration day and the date of his certificate of withdrawal.

Students registering at any time during the last four weeks of the Summer Session are required to pay for the remainder of the term

at the rate of twenty-five per cent of the term's tuition for each week or fraction of a week between the date of registration and the last examination day of the term.

Any tuition fee or other fee may be changed by the Trustees to take effect at any time without previous notice.

IN THE NEW YORK STATE SUMMER SESSION

Tuition in any of the undergraduate courses of the Summer School of Agriculture and of the Summer School of Home Economics is free to admitted students who are residents of the State of New York and who have been residents for at least one year immediately preceding registration. *An incidental fee of twenty dollars* is, however, charged to all students for admission. Students from outside the State of New York, whether they take one subject or more, are required to pay sixty dollars, in which is included the incidental fee.

Free tuition does not include instruction in the Summer School of Biology or any instruction outside the College of Agriculture and the College of Home Economics, nor are students receiving free tuition permitted to attend classes outside the College of Agriculture and the College of Home Economics.

Graduate students who register in the New York State Summer Session as candidates for advanced degrees are required to pay the regular tuition fee for graduate students as explained on page 13. If they have not previously matriculated in Cornell University, they must also pay a matriculation fee of ten dollars. See page 14.

OTHER FEES

In *Chemistry* a laboratory fee is charged for material actually consumed. A deposit of such amount as the instructor may prescribe must be made with the Treasurer.

Physics. For laboratory fees in physics see descriptions of courses.

In *Geography and Geology*, in Course S8 and in Course S9 a fee of one dollar must be paid in advance to the Treasurer to cover incidental expenses of the course.

In *Public Speaking*, Course S 45, a special laboratory fee of five dollars is required.

Biology. A laboratory fee is charged for each course in Biology, the fee varying with the character of the course. The amount which the student must expect to pay upon beginning any course is stated in the description of that course, under the head of Summer School of Biology, page 53.

Physical Education. A special charge of ten dollars is made for instruction in Tennis and in Swimming.

Shop-work. Students not matriculated in the College of Engineering of Cornell University are required to pay a fee of \$3.50 for each credit hour of shop-work for which they register.

Library. A person who obtains the privilege of taking books from the University Library for home use is required to make a deposit of five dollars, which will be refunded upon the return of all books taken out.

Willard Straight Hall. A fee of three dollars is charged for the privileges of Willard Straight Hall. See page 20.

RESIDENTIAL HALLS: ROOMS: BOARD

FOR WOMEN

The University has two groups of residential halls for women in which board and room can be obtained during the Summer Session by registered students only. They are:

Sage College, which accommodates 175 persons. Here the charge for room and a specified amount of laundry, for the session, is from \$24 to \$39, according to the size and location of the room. The dining room will not be open. Board may be obtained at Willard Straight Hall, across the green from Sage, or at the cafeteria in the Home Economics Building.

Prudence Risley Hall, which accommodates 184 persons. Here the charge for room, board, and a specified amount of laundry, for the session, is from \$78 to \$87, according to the size and location of the room.

Besides these halls there are, off the campus, certain *approved houses*, which are privately owned and occupied, which are under the general supervision of the Dean of Women, and in which women students exclusively are accommodated.

Undergraduate women students of Cornell and other colleges and other women students under twenty-one years of age are expected to live in the residential halls or the approved houses. Any woman student should consult the Dean of Women before engaging a room.

In the residential halls for women the charge for room and board includes dinner and lodging Saturday night, July 7 (not earlier), and all meals to and including breakfast Saturday, August 18.

Members of the Summer Session who lodge outside Prudence Risley Hall may obtain table board at that hall for \$9 a week (or \$48 for the six weeks of the session).

Each of the residential halls is in charge of a warden, who is glad to know the students, to advise them in illness or other emergency, and to give them whatever information they wish about the University or the town. It is understood that persons living in the halls will conform to the house regulations made for the convenience and comfort of all.

Application for rooms in any of the residential halls or approved houses for women should be made to the Manager of Residential Halls, Morrill Hall, Ithaca, N. Y. Information about such rooms may be obtained from the Manager in advance of the application. The list of approved houses will be available after June 1 on application to the

Manager, and also, if desired, a supplementary list of private houses with desirable rooms available for mature women who prefer to live outside any of the halls or approved houses. Checks should be drawn to the order of Cornell University.

A *deposit of five dollars* must accompany each application for a room in any of the residential halls; otherwise the application will not be entertained. The rooms are reserved in the order of application. If a room assigned is occupied by the applicant, the amount of the deposit is held until the end of the session to cover the return of keys and any damage to building or furniture other than ordinary wear and tear, and to insure the completion of the lease. The deposit will be refunded if the applicant gives formal notice to the Manager on or before June 15 that she wishes to withdraw her application.

FOR MEN

Men regularly enrolled in the Summer Session can obtain comfortable rooms in the Residential Halls for Men, which are thoroughly modern and of fireproof construction.

In the *Residential Halls* the charge for furnished room, including care of the room and laundry of bed linen, is \$18 for the session. There are a few suites at a higher rate, and some rooms on the top floor may be had for less.

Board can be obtained for an average of \$1 to \$1.50 a day in Willard Straight Hall or in other dining rooms or restaurants on or near the campus.

Applications for rooms in the Residential Halls for Men, or for plans of the rooms or other information about them, should be made to the Manager of Residential Halls, Morrill Hall, Ithaca, N. Y. Checks should be drawn to the order of Cornell University.

A list of private houses offering desirable rooms for rent for the session can be obtained after June 1 by application to the Manager of Residential Halls, Morrill Hall, Ithaca, N. Y.

THE COST OF LIVING

An estimate of the cost of living in Ithaca in the summer can be made by consulting the figures given above. In a private house rentals vary according to the location. Rooms are rented with the understanding that they will be occupied for the entire session unless both parties agree otherwise. Table board is generally engaged by the week.

MEANS OF SELF-SUPPORT

Students, either men or women, who wish to earn a part of their expenses during the session are invited to correspond in advance with the Manager of Residential Halls, Morrill Hall, Ithaca.

THE CASHING OF CHECKS

The Treasurer of the University accepts checks in settlement of charges payable at his office, but a rule of the Board of Trustees forbids him to cash any credit instrument, even to the extent of accepting a check or draft in amount greater than the sum due and returning the excess in cash. Students are therefore advised to open an account in an Ithaca Bank as soon as they arrive in town, or else provide themselves with travelers' checks, drafts on New York City banks, money orders, or other form of credit instrument such as a bank will cash in the ordinary course of business.

THE STUDENT'S HEALTH

MEDICAL ADVICE

The University's staff includes medical advisers of men and of women with a corps of assistants. The medical advisers observe regular office hours, from 9 A. M. till 1 P. M. daily, at the medical offices in the Old Armory. A trained nurse is on duty from 2 P. M. till 4 P. M. daily. No charge is made for these services.

In cases of illness or indisposition which involve absence from classes even for one day, students are expected to report immediately either in person, by telephone, or by messenger to the medical adviser's office. For the convenience of the adviser such illness should be reported early in the day. Students indisposed but still able to attend classes should consult the medical adviser immediately in order that advice may be given and that diagnosis of incipient diseases may be made promptly. Any student failing to report as soon as possible to the medical adviser any contagious or infectious disease will be regarded as guilty of a serious breach of discipline.

A medical examination is not required of students in the Summer Session.

A student may at any time be requested to withdraw from the University if, in the opinion of the University authorities, the condition of his health is such as to make it unwise for him to remain.

Every student matriculating in Cornell University must present a certificate showing that he has been vaccinated within five years. Students in the Summer Session are not matriculated students and of them accordingly such vaccination certificate is not required. If, however, students attending the Summer Session should matriculate in any of the colleges of the University or in the Graduate School, they must give evidence of recent vaccination like others so matriculated.

THE UNIVERSITY INFIRMARY

The University Infirmary occupies three large buildings near the campus. The first of these, a brownstone structure, was the residence of Henry Williams Sage, for many years chairman of the Board of Trustees of the University. The second building, the Schuyler

House, was purchased in 1911; in 1912 the Trustees erected a third building, fireproof, and this is the present main hospital building. The normal capacity of the Infirmary is seventy-five beds; the number can be doubled in an emergency.

The Infirmary, which is in charge of an experienced superintendent and is thoroughly equipped, provides suitable rooms, food, and nursing for sick students. It has no medical staff; students find their own physicians among practitioners in Ithaca or elsewhere. •

Students in the Summer Session have all the privileges of admission to the Infirmary. They pay no fee in advance, but are liable to regular charges for services rendered.

THE LIBRARIES

The University Library is open on week days from 8 A. M. till 10:30 P. M. In this building are the main library, containing about 500,000 volumes, and most of the seminary and special libraries. The main reading room affords accommodations for more than two hundred readers, and contains a selected library of about 8,000 volumes of reference works. Below stairs is the periodical room in which are kept the current numbers of about 500 journals in various fields of knowledge. These rooms are open to all students. Students properly qualified are allowed the use of the seminary rooms and the books in them. The main collection is primarily a library of reference for use in the building. Students are, however, to a limited extent, allowed to take out books for home use. Persons wishing this privilege must make a deposit of \$5, which will be refunded upon the return of all books taken out.

The reference library in Goldwin Smith Hall is open for the use of summer students from 9 A. M. till 5 P. M. on week days except Saturday, when it is closed at noon.

The library of the Law School numbers more than 56,000 volumes and about 5,800 pamphlets, to which generous additions are made yearly. It includes the library of the late Nathaniel C. Moak of Albany, N. Y., which was presented in 1893 by Mrs. A. M. Boardman and Mrs. Ellen D. Williams, as a memorial to Judge Douglas Boardman, the first dean of the School. In reports of the federal courts, and of the several American state jurisdictions, and in English, Scotch, Irish, Canadian, Australian, and English colonial reports, the law library is practically complete to date.

The Library of the College of Agriculture, in the basement of Stone Hall, is open on week days from 9 A. M. till 5 P. M., except Saturday, when it is closed at 1 P. M. In it will be found a large collection of bulletins and reports of experiment stations, reference books on agriculture and country life, agricultural periodicals, and the like. The entomological library, in the department of entomology on the fourth floor of Roberts Hall, is one of the most complete of its kind in the United States. Nearly all of the departments in which instruction is given have well-selected departmental libraries.

WILLARD STRAIGHT HALL

All privileges of Willard Straight Hall, the social center of the University, are open to Summer Session students, both men and women, as during the regular college year. In accordance with regular procedure, a fee of \$3 is required of all summer registrants, payable at the time of the regular tuition fee.

SAGE CHAPEL

Religious services are conducted in Sage Chapel throughout the academic year by clergymen of various religious denominations. There will be services in the Chapel on five Sundays during the Summer Session, July 15 to August 12 inclusive.

LECTURES: MUSICAL RECITALS: EXCURSIONS

In addition to the regular classroom work there will be general public lectures on Monday evenings, and also lectures of general interest each week in connection with the work of various departments. They will be all announced in the Weekly Calendar.

Organ recitals will be given each Sunday evening in Bailey Hall by Assistant Professor Harold D. Smith, the University Organist. A series of lecture recitals will be given on Thursday evenings in the Memorial Hall of Willard Straight Hall, by members of the staff of the Department of Music. These recitals are free to all students.

Wednesday evenings are devoted to the departmental conferences, which are open to all interested persons. Notice of these conferences will be given from week to week.

Excursions, in connection with the work of certain departments, are made to many points of interest. Some of them are open to all members of the Summer Session. Especially noteworthy are the excursions conducted by the Department of Geography and Geology to Taughannock Falls by boat, and to Watkins Glen and Niagara Falls.

RAILROAD ROUTES TO ITHACA

Ithaca can be reached from New York City by either the Delaware, Lackawanna & Western or the Lehigh Valley Railroad. On both roads there are good trains carrying Pullman cars, on the Lackawanna by day, on the Lehigh Valley by day and by night. Passengers from the west reach Ithaca by way of the Lehigh Valley Railroad from Buffalo. From stations on the Boston & Albany Railroad, the shortest route to Ithaca is by way of Syracuse and Auburn. From Philadelphia, and from Baltimore, Washington, and the south by way of the Baltimore & Ohio, the Philadelphia & Reading connects with the Lehigh Valley at Bethlehem. From stations on the Erie, connections with Ithaca can be made either by the Lackawanna at Owego or by the Lehigh Valley (Elmira and Cortland

branch) at Elmira. Ithaca has connections with the New York Central at Geneva, Auburn, and Canastota.

REDUCED RATES BY RAIL

Students coming from points in the territory of the Central Passenger Association and of the Trunk Line Association are assured of a special round-trip rate of a fare and a third. Tickets will be on sale from July 5 to 10 inclusive, and the return limit will be August 21. The specified territories extend west to Chicago, St. Louis, and Cincinnati, and south to Washington; but do not include New England. Similar rates from other sections may also be available. Students should make inquiries at their local railroad offices.

In order to avail themselves of reduced rates students must secure in advance proper certificates of identification, which may be had on application to the Summer Session, Goldwin Smith Hall, Ithaca, N. Y.

COURSES OF INSTRUCTION

Subjects of instruction are in alphabetical order.

Most of the courses consist of five exercises a week, or one hour each week day except Saturday. The number of actual hours of class work in any course can be found by multiplying the number of weekly exercises by six.

Courses in brackets are not offered in 1934, but may be expected in 1935.

Since instruction begins on Tuesday, classes scheduled for five meetings a week will meet as usual on the first Saturday, July 14.

GS signifies *Goldwin Smith Hall*.

ASTRONOMY

S 1. General Astronomy. Credit two hours. Lectures and recitations, daily except Sat., 8. *Lincoln* 31. Professor BOOTHROYD.

S 2. Laboratory Astronomy. Credit one hour. Laboratory, T and Th, 7:30 to 10 p. m. *Observatory*. This course must be preceded or accompanied by Course S 1. Professor BOOTHROYD.

These two courses together offer an introduction to astronomical ideas and methods and give an especially good background for teachers who may wish to prepare more thoroughly for teaching general science or geography. Those who take both courses may count the three hours toward fulfilling the requirement of Group 4 in the College of Arts and Sciences.

The lectures are illustrated by models and by lantern slides. The 12-inch equatorial and other instruments of the Observatory are used for observation and instruction.

Fath's *Elements of Astronomy* and Duncan's *Astronomy* are used as reference books in Course S 1; and Stetson's *Manual of Laboratory Astronomy* is used in Course S 2.

CHEMISTRY

The courses announced below correspond entirely or in part with courses given during the regular sessions of the University. For regular students the requirements for admission to the various courses will be the same as during the year.

Teachers may be admitted to any course for which their general training or experience may be considered to prepare them. Every effort will be made to meet the individual needs of teachers by arranging and modifying the work as far as possible so as to fulfill the particular requirements in each case.

All courses in Chemistry are given in the *Baker Laboratory of Chemistry*.

S 101. Introductory Inorganic Chemistry. Credit three hours. Lectures, daily except Sat., 8. Ten additional lectures at hours to be arranged. *Main Lecture Room*. Assistant Professor LAUBENGAYER and Mr. HOUPt.

The lectures deal with the fundamental theories and laws of chemistry, and with the more common elements and their compounds. They are profusely illustrated by experiments. The course is primarily designed to meet the needs of teachers in secondary schools, and to that end emphasis is laid upon methods of lecture presentation and experimental demonstration. Students other than teachers must, before registering, satisfy the department that they are properly prepared to carry on the work.

S 105. Introductory Inorganic Chemistry. Recitations and laboratory practice. Credit three hours.

Laboratory, M W, 9-1, and T Th F, 10-1. *Rooms 177 and 150.* Assistant Professor LAUBENGAYER and Mr. BRANT. A series of experiments designed to illustrate the fundamental laws of chemistry and to acquaint the student with the properties of the principal elements and their compounds. For the benefit of teachers who may take the course special attention will be given to the methods of laboratory instruction, quantitative experiments, and the blowing of simple glass apparatus.

Recitations, T Th F, 9. *Room 22.* Assistant Professor LAUBENGAYER. The recitations deal with the subject matter of the lectures and with the experimental work in the laboratory and afford thorough drill in the solution of chemical problems.

S 205. Introductory Qualitative Analysis. Credit three hours. Must be taken with course S 206. Lectures and recitations, daily except S, 8, T Th, 11. *Room 206.* Assistant Professor NICHOLS.

A study of the application of the theories of general chemistry to the systematic separation and detection of the common elements and acid radicals.

S 206. Introductory Qualitative Analysis. Credit three hours. Must be taken with course S 205. Laboratory, daily except S, 9-1. *Room 294.* Assistant Professor NICHOLS and Dr. MORSE.

A study of the properties and reactions of the common elements and acid radicals; the qualitative analysis of a number of solutions and solid compounds.

S 210. Introductory Qualitative Analysis. Shorter course. Lectures and laboratory practice. Credit three hours. Lectures, daily except S, 8. *Room 206.* Assistant Professor NICHOLS. Laboratory, daily except S, 9-12. *Room 294.* Assistant Professor NICHOLS and Dr. MORSE.

The properties and reactions of the common elements and acids, and their detection in various liquid and solid mixtures.

S 225. Introductory Quantitative Analysis. Shorter course. Lectures and laboratory practice. Credit three hours. Lectures, M W F, 11. *Room 206.* Assistant Professor NICHOLS. Laboratory, daily except S, 8-11. *Room 294.* Assistant Professor NICHOLS and Dr. MORSE.

A study of the fundamental principles of gravimetric and volumetric analysis, and the analysis of various substances by these methods.

S 230. Advanced Quantitative Analysis. Recitations and laboratory practice. Credit three hours. Laboratory, daily except S, 8-1. *Room 294.* Assistant Professor NICHOLS and Dr. MORSE.

The calibration of weights and volumetric apparatus; the analysis of ferrous and non-ferrous alloys, silicates, and organic substances by various gravimetric, volumetric, and combustion methods.

S 305. Introductory Organic Chemistry.

A. Credit three hours. Lectures and written reviews. Daily, 8, throughout the session, and also daily, 9, during the first three weeks. *Room 207.* Professor JOHNSON.

The lectures discuss systematically the more important compounds of carbon, their occurrence, methods of preparation, reactions, and uses. The work covered is equivalent to the first half of the year course.

S 310. Introductory Organic Chemistry.

A. Credit one to three hours. Laboratory practice and oral reviews. Open to those who have had or who are taking S 305 A. Hours to be arranged, in the mornings. Dr. TALLMAN.

B. Credit one to three hours. Laboratory practice and oral reviews. Open to those who have had S 305 A and S 310 A. The course is a continuation of Part A. Hours to be arranged, in the mornings. Dr. TALLMAN.

The student prepares a number of typical compounds and familiarizes himself with their properties, reactions, and relations.

S 320. Advanced Organic Chemistry. Credit two or more hours. Laboratory practice at hours to be arranged, in the mornings. Professor JOHNSON.

An advanced course in the preparation of organic compounds, involving the use of the more difficult classical methods and of the less common reagents.

S 375. Introductory Organic Chemistry. Shorter Course. Lectures and written reviews. Daily, 8-10. *Room 207.* Professor JOHNSON.

A shorter course in organic chemistry, designed for students in home-economics, pre-medical, biological, and agricultural curriculums. Required of students in certain of these curriculums. Credit four hours for lectures and written reviews.

Laboratory practice. Credit one or two hours. Hours to be arranged, in the mornings. Dr. TALLMAN.

Students preparing for the study of medicine should learn the requirements in Organic Chemistry of the medical school which they intend to enter, and if more than six hours of credit are required, should register in Chemistry 305 and 310.

S 405. Introductory Physical Chemistry.

A. Credit three hours. Lectures, daily except S, 8, and two other lectures at hours to be arranged. *Room 7.* Professor BRIGGS. A systematic presentation of modern chemical theory. The subject matter includes: gases, liquids, and solids; chemical equilibrium in homogeneous and heterogeneous systems; the phase rule and its applications; the theory of solution; the elements of thermochemistry and thermodynamics.

B. Credit three hours. Lectures, daily except S, 9, and two other lectures at hours to be arranged. *Room 7.* Professor BRIGGS and Mr. CONGDON. A continuation of Part A. The subject matter includes the theory of solution; ionic equilibria; reaction velocity and catalysis; elementary electrochemistry; the application of the phase rule to systems of two and three components.

S 410. Physical Chemistry Laboratory. A. Credit three hours. Laboratory practice, daily except S, 8-1. *Room 1.* Professor BRIGGS and Mr. CONGDON. Open only to those who have taken or are taking course S 405A or its equivalent. With the data obtained in the laboratory as a basis, detailed reports are written covering each of the following topics: molecular weight determination by vapor density; boiling point and freezing point methods; vapor pressure; viscosity; distillation of liquid mixtures.

B. Credit three hours. Laboratory practice, daily except S, 8-1. *Room 1.* Professor BRIGGS and Mr. CONGDON. Open only to those who have taken or are taking course S 405 B or its equivalent. The course is a continuation of Part A. The following topics are considered: dissociation; solubility; reaction velocity and catalysis; indicators; thermochemistry; diffusion; colloids and adsorption; phase rule studies.

S 465. Laboratory Practice in Physical Chemistry. Credit one to three hours. Laboratory periods to be arranged. Professor BRIGGS and Mr. CONGDON.

This course is designed to afford opportunity for special laboratory practice in physical chemistry, colloid chemistry, or electrochemistry.

S 505. Introductory Chemical Spectroscopy. Lectures and laboratory practice. Credit three hours. Lectures, daily except Sat., 9. *Room 302.* Laboratory practice, M F, 2-5. *Room 396.* Professor PAPISH and Dr. KETCHAM.

The construction and use in chemical analysis of the spectroscope, polariscope, refractometer, colorimeter, and nephelometer. The laboratory instruction is devoted to training in the use of these instruments in the solving of chemical problems.

S 520. Spectrographic Methods. Credit one or more hours. Laboratory practice at hours to be arranged. Prerequisite course S 505. *Room 396.* Professor PAPISH and Dr. KETCHAM.

Application of photographic methods to arc, spark, and absorption spectroscopy as aids in chemical analysis.

Students not desiring University credit may arrange to cover different branches of chemical spectroscopy to suit their special needs.

S 530. Introductory Chemical Microscopy. Lectures and laboratory practice. Credit three hours. Lectures, M, 10-12, W, 1:40. *Room 377.* Laboratory, W F, 10-12, T Th, 10-1; W, 3-4. *Room 378.* Professor MASON.

Microscopes and their accessories, as applied to problems in chemistry and technology. Micrometry; quantitative analytical methods; optical properties of

crystals and other doubly refractive materials; physico-chemical studies; illumination, photomicrography, and ultramicroscopy; recognition of textile and paper fibers.

S 535. Advanced Chemical Microscopy. Laboratory practice. Credit two or three hours. Prerequisite course S 530. Laboratory periods and conference hours to be arranged. *Room 378.* Professor MASON.

Practice in the examination and analysis of inorganic substances containing the more common elements, with special reference to rapid qualitative methods and to the analysis of minute amounts of material.

Students not desiring University credit, who wish to secure a working knowledge of Chemical Microscopy in the shortest possible time, may arrange with the instructor to cover the parts of both of the above courses which best meet their needs.

S 195, S 295, S 395, S 495, S 595. Research. Credit one to six hours. Senior chemists, and others by special permission, may elect research in the fields of Inorganic, Analytical, Organic, or Physical Chemistry, or Chemical Spectroscopy, or Chemical Microscopy, under the direction of the respective members of the staff of instruction.

NON-RESIDENT LECTURESHIP ON THE GEORGE FISHER BAKER FOUNDATION

S 1000. Lectures: Isotopes. Credit three hours. M W F, 12. *Room 177.* Professor LEWIS.

Isotopes: An account of the discovery of isotopic forms of an element; a study of the difference in properties of isotopic forms as determined by experiment and predicted by theory; theory and practice of isotopic separation.

DRAWING: PAINTING

S 1. Elementary Drawing. Credit two hours. Daily except Sat., 10-12. *Franklin.* Assistant Professor STONE and Mr. WASHBURN.

This course for beginners in drawing embraces freehand perspective, drawing of geometrical objects and simple casts. The course will begin with pencil work and continue with light and shade in charcoal.

S 2. Elementary Color. Credit two hours. Daily except Sat., 8-10. *Franklin.* Assistant Professor STONE and Mr. WASHBURN.

Instruction for beginners in color. Students work in pastel from simple groups. Talks will be given on the theory of color.

S 4. Antique. Credit two hours. Daily except Sat., 10-12. *Franklin.* Assistant Professor STONE and Mr. WASHBURN.

Prerequisite for this course is a knowledge of the elements of drawing. Instruction will be given in charcoal from casts.

S 5. Advanced Color. Credit two hours. Daily except Sat., 8-10. *Franklin.* Assistant Professor STONE and Mr. WASHBURN.

As in elements of color, students in advanced color work from groups (vases, fruit, flowers) in oil or in water color. Those who have not had elements of color may enter this course on submission of examples of original work. Copies of others' work will not be sufficient for entrance.

S 6. Outdoor Sketching in Color. Credit two hours. Daily except Sat., 2-4. *Franklin.* Assistant Professor STONE and Mr. WASHBURN.

A knowledge of the elements of drawing and the elements of color is a prerequisite to this course. Instruction is given in oil from landscape.

The unusual variety and charm of the natural environment of Cornell give an abundance of subject-matter from which to work. There are woodland, open farming country, lakes and streams, broad panoramic views, and rugged gorges within easy walking distance of the campus. The student is therefore inspired by surroundings of unique beauty.

ECONOMICS

The following courses are designed to meet the needs of three classes of students in the Summer Session: (1) those desiring regular college credit for general economics; (2) students with special interests in economic subjects; (3) students seeking broad preparation for the teaching of economics in the secondary schools. For the first group, Course S1 covers the subject matter usually included under elementary economics. For Cornell students: Course S1 satisfies the economics requirement in the College of Engineering and will also serve in lieu of Course 1 as a prerequisite for admission to various advanced courses in economics; Course S11 satisfies the requirement of Money and Banking in Administrative Engineering and serves as a prerequisite for Course 14. Graduate students wishing to pursue special investigations will be afforded assistance by members of the Department of Economics who may be in residence in Ithaca during the summer.

S 1. Modern Economic Society. Credit four hours. Twice daily except Sat., 9 and 10. *GS 142.* Assistant Professor JOHNSON.

Survey of the existing economic order, its more salient and basic characteristics, and its operation.

S 5. Current Economic Problems. Credit two hours. Daily except Sat., 8. *GS 264.* Assistant Professor MONTGOMERY.

A course designed to afford students who have taken an introductory course in Economics the opportunity to become acquainted with some of the more important problems of current interest. Among the topics treated: the theory and operation of the National Recovery program; present efforts to raise the general price level; the agricultural relief program; tariffs, international economic policies, and attempts to stabilize currencies by international action; the war debts; railroad problems and recent railroad legislation; the trust problem and recent changes in traditional anti-trust policy; proposals for long-run economic planning.

S 11. Money and Banking. Credit two hours. Daily except Sat., 11. *GS 264.* Professor REED.

A study of the history and the theory of money and banking. Will serve as a prerequisite for Economics 14 in regular session.

S 12. Financial History of the United States. Credit two hours. Daily except Sat., 11. *GS 234.* Assistant Professor O'LEARY.

A study of developing financial institutions and legislation from 1700 to 1900. Monetary, banking, and fiscal problems will be dealt with against the changing background of American economic organization.

S 15. Trade Fluctuations. Credit two hours. Daily except Sat., 9. *GS 264.* Professor REED.

A study of the causes of trade recessions and revivals, with considerable emphasis upon suggested remedies. Particular attention will be devoted to current developments.

S 31. Corporation Finance. Credit two hours. Daily except Sat., 9. *GS 234.* Assistant Professor O'LEARY.

A study of the financial problems of the business corporation from the points of view of the management, the investor, and the public.

S 41. Labor Economics and Labor Problems. Credit two hours. Daily except Sat., 10. *GS 264.* Assistant Professor MONTGOMERY.

Survey of the more basic labor problems growing out of modern industrial arrangements, with special reference to the conditions of the depression and to the labor implications of the Recovery program.

EDUCATION

All courses in Education are described under the Graduate School of Education pages 45-52.

ENGINEERING

The courses in engineering described below are equal in character to corresponding courses given in the College of Engineering during the regular session. They will be accepted for credit towards graduation by the several schools of the college so far as they apply to the prescribed work of the school concerned. Students in the College of Engineering who may desire to offer work done in the Summer Session toward graduation should consult the Director of the school in which they are regularly registered before registering in the Summer Session. Others may obtain information concerning these courses by applying to the Secretary of the College of Engineering.

Additional courses in Structural Engineering and courses in Hydraulics may be arranged to meet the needs of graduate students.

MECHANICS OF ENGINEERING

The following courses in Mechanics of Engineering are open to students from other universities, subject to the same requirements for admission as are made for Cornell students. See the Announcement of the College of Engineering for more detailed description of Courses 221 and 223.

S 221. Mechanics. Mechanics of Materials. One section. Credit four hours. Equivalent to C.E. 221. Prerequisite course 220 or the equivalent. Recitations, daily except Sat., 8 and 11; and one computing period a week. See S 221A. Professor RETTGER, *Lincoln* 33C.

S 221 A. Mechanics Laboratory. Equivalent to C.E. 221 A. Credit one hour. Must be taken with S 221. Hours to be arranged.

S 223. Engineering Problems. Credit two hours. Equivalent to C.E. 223. Five computing periods a week. Hours to be arranged. Will be given only if enough students register for the course.

S 3M 22. Strength of Materials. Credit three hours. Daily, 8, Sat., 10, Fri., 1:40 to 4. Prerequisite Theoretical and Applied Mechanics, 3M 21, or equivalent. *West Sibley* 306. Assistant Professor PERKINS.

Stress, strain; strength and elastic properties of materials in tension, compression and shearing; riveted joints; torsion of shafts; helical springs; shear; moment, safe loading and deflection of simple beams; eccentric loads; columns; impact loads.

S 3M 23. Hydraulics. Credit 2 hours. Prerequisite Theoretical and Applied Mechanics, 3M 21, or equivalent. Assistant Professor PERKINS.

Hydrostatics: pressures and centers of pressure. Hydrokinetics: general equations of energy; orifices, weirs, nozzles, Venturi meters, etc.; losses of head; flow in pipes. Hydro-dynamics: forces on stationary and moving bodies.

STRUCTURAL ENGINEERING

S 270. Structural Design and Bridge Stresses. Credit four hours. Lectures and recitations, daily except Sat., 8; computations and drawings at hours to be assigned. *Lincoln* 14 and 29. Prerequisite C.E. 220, 221. Assistant Professor BURROWS.

One-fourth of the course includes structural details, i. e., the design of a wooden roof truss and other timber joints. The remainder of the course includes dead load, live load, and impact stresses in simple bridge trusses due to uniform live panel loads, locomotive axle loads, and highway loads. Text: Urquhart and O'Rourke, *Stresses in Simple Structures*.

S 271. Structural Design. Credit three hours. Lectures, computations, and drawing. Daily, 10:30-12:50. *Lincoln* 14. Prerequisite C.E. 270. Assistant Professor BURROWS.

An elementary course in steel design. Complete design, detail drawing, bill of material, and estimate of weight of a steel roof truss, a through plate girder railroad bridge. Floor systems of highway bridges. Text: Urquhart and O'Rourke, *Design of Steel Structures*.

S 274. Bridge Design. Credit three hours. Computation and drawing, daily, 10:30-12:50. Prerequisite C.E. 271. Assistant Professor BURROWS.

Computations and drawing for the complete design of a riveted railroad or highway bridge. The computations to determine the sections of all members, joints, splices, and other details are to be written up in systematically arranged reports. The drawing consists of general plans showing the location of all rivets as well as the composition and relation of all members and connections. The final reports are to give a full list of shapes and plates, and a classified analysis of weight for the span.

S 280. Concrete Construction. Credit three hours. Daily, 9-10:30. Prerequisite courses C.E. 220, 221. Professor URQUHART.

Concrete materials, properties of plain concrete, its making and deposition; elementary theory of reinforced concrete as applied to columns, rectangular beams, and slabs; T-beams reinforced for compression; direct stress combined with flexure. Text: Urquhart and O'Rourke, *Design of Concrete Structures*.

S 281. Foundations. Credit three hours. Daily except Sat., 8. Prerequisite courses 220 and 221. Piles and pile driving, including timber, concrete, tubular, and sheet piles; cofferdams; box and open caissons; pneumatic caissons for bridges and buildings, caisson sinking, and physiological effects of compressed air; pier foundations in open wells; freezing process; hydraulic caissons; ordinary bridge piers; cylinders and pivot piers; bridge abutments; spread footings for building foundations; underpinning buildings; subterranean explorations; unit loads. Text: Jacoby and Davis, *Foundations of Bridges and Buildings*. Recitations, collateral reading in engineering periodicals, and illustrated reports. Professor URQUHART.

S 285. Reinforced Concrete Design. Credit three hours. Daily except Sat., 10:30-12:50. Prerequisite course 280. Professor URQUHART.

Theory and design of gravity, cantilever, and counterfort retaining walls. Design of multiple column footings of reinforced concrete. I-beam grillages. Design of bins and tanks: subsurface and supported on towers. Reports and sketches.

ELECTRICAL ENGINEERING

The courses described below will be given in 1934, as they were given in 1933, only if a sufficient enrollment is assured. Prospective students should communicate with Professor Strong before the opening of the Summer Session.

S 410. Principles of Electrical Engineering. Credit four hours. Daily except Sat.: Lectures, 9; computations, 10-1. Prerequisite Physics 21, Mathematics 5a and 5b or the equivalent. *Franklin*. Assistant Professor STRONG.

Equivalent to E.E. 410 (formerly 411) and E.E. 415. Introductory direct current circuit and machine theory.

S 416. Principles of Electrical Engineering. Credit three hours. Lectures, daily except Sat., 8; computations, M W F, 10-1. Prerequisite E.E. 415 or the equivalent. *Franklin*. Assistant Professor STRONG.

Equivalent to E.E. 416. Elementary alternating current circuit and machine theory.

S 3A23. Business and Industrial Management. Credit three hours.

This course is intended as a survey of the problems of business and industrial organization. It deals with the establishment of business policies, types of business and industrial ownership, together with the functions of finance, control, machine production, personnel, marketing and advertising. Elementary consideration will be given to the problems of the selection of plant site, time and motion study, wage systems, and the selection of personnel. Professor BANGS.

ENGLISH

Courses S 1 and S 2 taken together will be considered the equivalent of either the first term or the second term of Course 1 or of Course 3 in the regular University session, but not of both.

S 1. Composition. Credit two hours. Daily except Sat., 8. GS 124. Mr. BALDWIN.

A study of the elementary principles of composition, intended to teach the habit of clear and correct expression; reading of models, frequent writing of themes, class discussions; personal conferences at hours to be appointed.

S 2. Introductory Course in Literature. Credit two hours. Daily except Sat., 9. GS 124. Mr. BALDWIN.

A study of selections from Shakespeare, Milton, and writers of lyric poetry, intended to acquaint the student with works of the masters of English literature.

S 5. Teachers' Course. Credit two hours. Daily except Sat., 10. GS 160. Professor NORTHUP.

Lectures, readings, reports, and discussions. Designed for those who are teaching or who expect to teach English in schools. The organization of the high school course in English; the teaching of literature in general; supplementary reading for pupils and teacher; the use of the school library and the public library; stage productions; the place of language and grammar in the high school; problems of oral and written composition; the relation of composition to literature and to other subjects in the curriculum.

S 6. Nineteenth Century Poetry. Credit two hours. Daily except Sat., 12. GS 156. Dr. MARX.

A study of the poetry of Wordsworth and Coleridge, and of its relation to the new birth of English poetry. Texts: Oxford editions of these poets.

S 7. Nineteenth Century Poetry. Credit two hours. Daily except Sat., 9. GS 162. Professor MONROE.

A study and discussion of the most important poems of Byron, Shelley, and Keats. Texts: Oxford Byron, Modern Library Keats and Shelley.

S 8. Modern American Poetry. Credit two hours. Daily except Sat., 10. GS 156. Professor THOMPSON.

The leading poets from Emily Dickinson to the present. Text: Untermeyer, *Modern American Poetry*.

S 11. American Literature to the Civil War. Credit two hours. Daily except Sat., 8. GS 156. Professor THOMPSON.

A study of literary, social, and political ideals of America as reflected in the writings of Irving, Bryant, Cooper, Poe, Emerson, Thoreau, Hawthorne, Melville, Longfellow, Whittier, Holmes, and Lowell. Text: Quinn, Baugh, and Howe, *The Literature of America*, vol. i.

S 12. Victorian Literature. Credit two hours. Daily except Sat., 10. GS 162. Dr. MARX.

A study of some typical Victorian prose and poetry, including essays of Arnold and poems of Tennyson and Browning. Texts: Bouton, *Matthew Arnold, Prose and Poetry*; Woods, *Poetry of the Victorian Period*.

S 16. The English Language. Credit two hours. Daily except Sat., 11. GS 162. Professor MONROE.

A study of some significant features in the growth and development of the mother tongue: language and grammar in general; some misconceptions about the life of language; the relationships of English; phonetics; the English vocabulary; inflections; native resources and foreign influences; disputed usages; the bearing of historical grammar on present forms and usages, spoken and written.

Recitations, lectures, collateral reading. The course does not require previous knowledge of Old or Middle English.

S 17. Modern Drama. Credit two hours. Daily except Sat., 9. GS 156. Professor STRUNK.

A study of plays of recent and contemporary dramatists. Texts: Watson and Pressey, *European Plays*, vol. ii, and *English and Irish Plays*, vol. i; Montrose J. Moses, *Dramas of Modernism*.

S 20. Shakespeare. Credit two hours. Daily except Sat., 11. GS 156. Assistant Professor NUNGEZER.

A study of the dramatic art of Shakespeare as illustrated by *Hamlet*, *Macbeth*, *King Lear*, and *Antony and Cleopatra*. Designed especially for teachers of Shakespeare. Supplementary reading for those who wish a general knowledge of the Shakespearean age.

COURSES EXCLUSIVELY FOR GRADUATES

S 30. The Myths in Ancient and Modern Poetry. For graduates only. M W Th, 2-3:30. GS 183. Professor NORTHUP.

Lectures, readings, and reports. Designed as an introduction to the graduate study of literature, but open also to students who have already done some graduate work.

S 31. Dramatic Literature. For graduates only. Daily except Sat., 11. GS 160. Professor STRUNK.

A study of general principles. Reading and discussion of Allardyce Nicoll's *Theory of Drama* and of illustrative plays selected after consultation with the members of the seminary.

S 33. Beowulf. For graduates only. Hours to be arranged. Consult the instructor. Professor MONROE.

A knowledge of Old English is prerequisite.

S 34. Elizabethan Literature. For graduates only. Daily except Sat., 12. GS 160. Assistant Professor NUNGEZER.

Studies in representative non-dramatic literature of the sixteenth century, with emphasis on significant problems.

GEOGRAPHY AND GEOLOGY

The lecture rooms and laboratories are in *McGraw Hall*. It is the purpose of this department to meet, primarily, the needs of teachers. A second aim is to provide courses of practical and cultural value to college students. The work embraces lectures, laboratory, and field instruction in physical and commercial geography, and in the elements of geology. The environs of Cornell University are rich in phenomena of geographic and geologic interest. Field excursions, consequently, are made an especially important part of the work of this department in the Summer Session. The laboratories are well equipped with apparatus and illustrative material for instruction. The material includes teaching and reference collections of minerals, rocks, fossils, maps, photographs, models, and more than five thousand lantern slides.

Students planning to take work in the department should, if possible, register for courses on Monday, July 9, at the Drill Hall.

LECTURE COURSES IN GEOGRAPHY AND GEOLOGY

S 1. Physical Geography. Credit two hours. Daily except Sat., 9. *Geological Lecture Room, McGraw Hall* (first floor, south end). Professor VON ENGELN.

An introductory course in physical geography, including discussion of the nature and form of the continents; the structure and development of the relief of the land; the physiographic cycle in humid and arid regions; glaciers; the glaciation of North America; the elements of oceanography.

The lectures are illustrated by lantern slides, maps, models, and charts. Students registering in course S 1 are advised to take also the related courses S 8 and S 10.

S 2. Commercial and Industrial Geography. Credit two hours. Daily except Sat., 11. *Geological Lecture Room*. Professor VON ENGELN.

The effect of geographic factors on the production and distribution of commodities. Discussion of the origins and regional background of industry and commerce; the volume, extent, and utilization of important products and resources; location and growth of cities. Recommended for teachers who wish broad training in regional geography.

S 5. Geology. Credit two hours. Daily except Sat., 10. *Geological Lecture Room.* Dr. BURFOOT.

An introductory course in geology, consisting of lectures and assigned readings upon the following topics: origin of the earth; geologic history of the earth; materials of the earth's crust and their arrangement, as well as the forces modifying them; vulcanism, earthquakes, etc.; development of life on the earth.

The lectures will be illustrated with lantern slides, models, maps, and specimens. Students registering for this course are urged to take the laboratory course S 9 and, if possible, course S 10. Credit for Geology course 100 regular session will be allowed only for successful completion of all three courses S 5, S 9, S 10.

LABORATORY AND EXCURSION COURSES IN BOTH GEOGRAPHY AND GEOLOGY

S 8. Physical Geography, Laboratory Course. Credit one hour. T Th, 2-4. *Physical Geography Laboratory.* Dr. CONANT.

The members of this class will make a study of the physiographic regions of the United States, using contour maps, models, and the experimental laboratory of the department. By such study topographic, climatic, and biologic conditions (human, animal, and plant) will be correlated. There will be given also exercises on the other physiographic topics generally included in a laboratory study of the subject. The course will prove of worth to teachers of geography in the grades who wish to obtain a broader basis for their work in the subject as well as for those who expect to teach geography or general science in the high schools.

A laboratory fee of \$1 must be paid to the Treasurer at the beginning of the session to cover laboratory maintenance.

S 9. Geology, Laboratory Course. Credit one hour. W F, 2-4. *General Geological Laboratory.* Dr. BURFOOT.

This course is designed to supplement course S 5. A study will be made of the more common structural phenomena; of the interpretation and uses of geological maps; of characteristic life forms developed in different geological periods; and of the more common rocks and minerals. Short field excursions may be taken to collect both rock specimens and fossils.

A laboratory fee of \$1 must be paid to the Treasurer at the beginning of the session to cover laboratory maintenance.

S 10. Geography and Geology, Field Course. This course should be elected by all those registering in course S 1 or S 5. With courses S 1 and S 8 it affords a comprehensive course in physical geography; with courses S 5 and S 9 it will give a similarly broad training in elementary geology, as the dynamic phases of geology are emphasized on the excursions. Mimeographed outlines of the excursions are to be secured by each student desiring credit. See also a pamphlet, obtainable in Ithaca, on *The Geography and Geology of the Cornell Region.* Dr. CONANT and other members of the staff.

Students desiring credit or certificates of attendance must register in S 10 and will be given preference in accommodations.

Those desiring University or entrance credit must take field notes and hand in written reports. Excursions 1, 2, 3, 4, 5, are required of all students in the course, and in addition for one hour's credit they must take any two of the following four all-day excursions: 6, Taughannock; 7, Niagara; 8, Northern Pennsylvania; and 9, Watkins.

Meeting place and time announced in mimeographed outlines or by bulletin. Meet for first excursion, Monday, July 16, at McGraw Hall, 2 P. M. Excursions 1-5, Monday afternoons; 6, 7, 8, 9, all day. On the excursions to which a cost is attached, auto-bus, steamer, or railway trips, persons wishing to go must register at the department and secure tickets in advance of the date of the trip. The total cost of the trips will be from \$7 to \$10, according to the choices made. Announcements regarding field trips are posted on the middle door of *McGraw Hall* and all arrangements for reservations and tickets are made in the Geology Department Office, middle entrance, *McGraw Hall*. The trips are open to others besides the members of the excursion class as far as accommodations are available.

The longer excursions will be in charge of Dr. CONANT, with the cooperation and assistance of the other members of the instructing staff. On the excursions stops will be made at points of interest, explanations made, questions asked, and discussion invited.

OUTLINE OF EXCURSIONS: COURSE S 10

Monday Afternoons

1. **Snyder Hill.** To become acquainted with the lie of the land about Cornell, to learn the place names and nature of the broader physiographic features, studying enroute processes of weathering, and, at the summit, the maturely dissected plateau. The top of the hill is a vantage point from which a good view of the lake and the land for miles to the north, east, and west may be had. July 16.
2. **Cascadilla Creek.** To study the origin and nature of sedimentary rocks, also processes of erosion, transportation, deposition, and cementation. A study in detail of one of the large gorges and its special features. July 23.
3. **Portland Point.** By auto-bus. To study rock structure; intrusion of igneous rocks into sedimentary formations; rock-folding and small scale faulting and associated phenomena; vein-formation; fossil content of strata; economic utilization for cement. July 30.
4. **Enfield Gorge and Falls.** By auto-bus. To study the relations of pre-glacial and hanging valleys and the postglacial and interglacial gorges, their origin and features. Joint-plane guidance of stream courses. A ride to the head of the gorge, climb through it to the lower end past the crest of Lucifer Falls. Enfield is perhaps the most picturesque of the gorges in the Cornell region. August 6.
5. **Terminal Moraine.** North Spencer. By auto-bus. To study a massive morainic loop, the basin in which the former ice tongue rested, and the outwash deposits and overflow channels to the south. Truncated valley sides due to glacial erosion. The most striking examples of glacial phenomena in the Cornell region. August 13.

All-day Excursions

6. **Taughannock Gorge and Falls.** By steamer. To study the Inlet Plain, its reclamation, the Barge Canal terminal, the position and succession of the Devonian strata along the lake shore, and the deep gorge and falls of Taughannock, one of the highest straight falls east of the Rockies. Luncheon at the foot of the falls. July 21.
7. **Niagara Falls and Gorge.** Physiography, especially glacial phenomena, and geology of northwestern New York; physiography and geology of Niagara Falls and Niagara Gorge. By train and bus. July 29.
8. **Northern Pennsylvania.** Geology of a coal mine and the physiography of the Susquehanna valley at Wyalusing Rocks. Stops will be made to study Appalachian structure, folds and faults, and the stratigraphy of a complete section from the Portage beds of the Devonian through the Pottsville conglomerate of the Pennsylvanian. An exceptionally fine scenic trip by auto-bus over the Roosevelt Highway through southern New York and northern Pennsylvania. August 4.
9. **Watkins Glen.** By auto-bus. Watkins Glen is one of the most beautiful scenic spots in the country. The excursion party will study the gorge, its pot holes, and its falls in detail; and consider its relation to the Seneca Lake valley in comparison with the conditions at Ithaca in relation to the Cayuga valley. Luncheon at the head of the gorge. August 11.

FIELD COURSE

S 21. Summer Field School in Geology. Intended for students who desire to study geology in the field. The camp is located in central Pennsylvania near Tyrone and instruction covers a period of six weeks, from June 18 to July 29.

Six units of college credit are given upon successful completion of the course. Fixed expenses, including the regular tuition fee of \$60, are approximately \$150. Registration is limited to men. Assistant Professor NEVIN.

The region selected is especially suitable for field work in geology. Sedimentary rocks from Cambrian to the Coal Measures are represented, with a total thickness of some 27,000 feet. Folds and faults are extensively developed, and their effect on the topography is very marked. Instruction includes reconnaissance and detailed mapping. The course, open to students with either elementary or advanced training in geology, will be conducted to meet the individual needs of the student. A special circular containing detailed information will be furnished upon request.

GERMAN

S 1. First Year German. Grammar, composition, reading, oral training. Daily except Sat., 8 and 12. *GS* 183. Professor POPE. Credit four hours. Entrance credit, one unit.

After successfully completing this course, students can, by supplementary reading during the summer, prepare themselves for the College Board entrance examination in second year German.

S 3. Third Year German. Reading, grammar, composition, oral training. Daily except Sat., 8 and 12. *GS* 177. Professor FAUST. Credit four hours. Entrance credit, one unit (third unit).

Prerequisite: two years of high school German or the equivalent.

S 8. Richard Wagner. Credit two hours. Daily except Sat., 9. *GS* 190. Professor POPE.

Lectures in English on Wagner's theory of the music drama, the sources of his operas, his place in German literature, and his influence on modern culture. The German texts of the principal operas will be read in class and occasional illustrative recitals will be given in conjunction with the Department of Music.

S 10. German Drama of the Nineteenth Century. Credit two hours. Daily except Sat., 10. *GS* 183. Professor FAUST.

Readings, lectures, discussions. Textbook: T. M. Campbell's *German Plays of the Nineteenth Century*.

German Lectures. Lectures or interpretative readings in German will be given by members of the department on Wednesday evenings at 8 o'clock in *GS* 190.

German Conversation. A special table for conversation in German will be reserved in Prudence Risley Hall in case a sufficient number of applications are received by the Department of German, Goldwin Smith Hall 182, before July 1.

GOVERNMENT

S 1a. The Foundations of Government. Credit two hours. Daily except Sat., 9. *Boardman* D. Professor STORY.

A study of the political process and of the fundamental problems which arise in connection therewith. Illustrative material drawn from American and current European political life and institutions.

S 31. Public Opinion. Credit two hours. Daily except Sat., 11. *Boardman* D. Professor STORY.

A study of attitudes toward public policy in the United States, of the agencies for the formulation and expression of opinion, and of the function of public opinion in popular government.

HISTORY

S 1. Imperial Rome (B. C. 30 to A. D. 337). Credit two hours. Daily except Sat., 9. *Boardman* E. Professor LAISTNER.

This course will (1) trace the political and administrative history of the Roman Empire to the death of Constantine; (2) offer a general survey of its economic and cultural life.

Some provision will also be made for informal study and conference with the instructor in the case of graduate students working for a higher degree.

S 4. The Age of the Enlightenment. Credit two hours. Daily except Sat., 10. *Boardman B.* Associate Professor GERSHOY.

Eighteenth century liberalism in western Europe, with particular reference to the influence of the French *philosophes* and the work of the Enlightened Despots.

S 5. Modern European History. Credit two hours. Daily except Sat., 11. *Boardman C.* Associate Professor GERSHOY.

A general survey of the history of Europe from about 1500 to 1815, with special emphasis upon social and economic developments.

S 7. Tudor and Stuart England. Credit two hours. Daily except Sat., 9. *Boardman F.* Professor MARCHAM.

Politics, the Renaissance and Reformation, the economic revolution. Readings in contemporary literature. Primarily for seniors and graduates.

S 8. Modern England. Credit two hours. Daily except Sat., 12. *Boardman F.* Professor MARCHAM.

The chief characteristics of the political, economic, social, and intellectual life of England since 1832, to be studied by way of a consideration of some leading writers of the period. Primarily for sophomores and juniors.

S 14. American History, Westward Expansion, 1750-1830. Credit two hours. Daily except Sat., 8. *Boardman D.* Professor BRETZ.

A survey of the crossing of the Appalachian barrier and the creation of new states in the Mississippi Valley. The emphasis is upon the social history of the movement, but attention is paid to problems of war and diplomacy connected with northern and southern frontiers and to the more recent literature of the westward movement.

S 16. The United States Since 1876. Credit two hours. Daily except Sat., 9. *Boardman D.* Professor WHITAKER.

Political and social history of the United States from the end of Reconstruction to the present. Lectures, readings, discussions.

S 17. Contemporary History and its teaching in the secondary schools. Credit two hours. Daily except Sat., 10. *Boardman C.* Mr. KIDGER.

The history of Europe since the war: the Peace Treaty; the conference of the premiers and of the ambassadors; the League of Nations; England; France; Italy; Germany; Austria; Hungary; Czechoslovakia; Jugoslavia; and Poland. Both in method and in content the course will be useful to teachers in secondary schools especially such as teach the courses in world history prescribed by the new syllabus of the University of the State of New York.

S 30. Teachers' Course in Social Studies. See Education, page 48.

LATIN

The work of the Summer Session in the field of Latin study is intended primarily for actual and prospective teachers of the subject in the secondary schools.

A series of advanced courses is offered for those who by their undergraduate training are qualified to enter the Graduate School or to continue their work therein as candidates for the degree Master of Arts, with Latin as a major or a minor subject.

Other courses are offered, theoretical and practical, for those high-school Latin teachers who either desire a clearer comprehension of the aims and of the technique of classical teaching in secondary schools, or require specific training in the content of their school courses.

Prospective students in the 1934 Summer Session are invited to correspond with Professor Charles L. Durham, Goldwin Smith Hall, Ithaca, N. Y., concerning the nature and the scope of the work in Latin. Those who wish to begin their candidacy for the degree Master of Arts should forward to the office of the Graduate School, on or before June 25, such credentials of undergraduate work leading to the degree of A. B. as will entitle them to admission to the Graduate School. See page 9.

S 1. The Second and the Third Year of High-School Latin. Primarily for those who have an acquaintance with the field, and actual or prospective experience in teaching. Lectures, discussions, and conferences.

Objectives, standards, means of determining progress, validity of various types of test. A special consideration of the content of the work of the second and the third year. Cicero's orations and his oratorical style.

Credit two hours. Daily except Sat., 9. *GS 128.* Professor DURHAM.

The credit of two hours carried by this course is countable toward the group of six semester hours in General and Special Methods required by the New York State Department of Education as part of the prerequisite for the Professional Certificate for high school teaching. Similar credit in an elective group will be recognized by the State of Pennsylvania. Students from states where other requirements for teachers' certificates are in force are advised to secure in advance from their own school authorities an indication that this course will be counted towards the satisfaction of their particular professional requirements.

S 2. Problems and Methods of Graduate Work in Latin. A general survey of the various fields of advanced Latin study, with direction of work and training in method in accordance with the needs and qualifications of the individual students. Phonetics, Sounds and Flexions of Latin, Vulgar Latin and the development of the Romance languages, Epigraphy, Topography and Archaeology, Historical Syntax, Metrics, Textual Criticism, etc.

Credit two hours. Daily except Sat., 10. *GS 128.* Professor DURHAM.

S 3. Theses and Informal Work. Direction in the preparation of theses by candidates for the Master's degree. Investigation of special problems which arise in connection with the work of individual teachers. Three hours a week by appointment. Professor DURHAM.

MATHEMATICS

Each teacher will have a daily office hour for consultation with students. It is urged that this opportunity be utilized by all concerned.

In the following list, courses S 1 to S 5b are the equivalent of courses having the same numbers in the *Announcement of the College of Arts and Sciences* for 1933-34.

Courses S 1, S 2, S 3, are planned for those teachers in the secondary schools who wish to review these subjects. They are equivalent to the advanced entrance requirements of Cornell University and of the College Entrance Examination Board. They presuppose a ready knowledge of elementary and intermediate algebra and of plane geometry. University credit for S 1, S 2, S 3, three hours each.

Students taking S 5a or S 5b are requested to take no other University work during the session without special permission of the Department. University credit for S 5a, S 5b, five hours each.

S 1. Solid Geometry. Daily 9. *White 1.* Professor GILLESPIE. (Office hour, 10, *White 3.*)

S 2. College Algebra. Daily, 10. *White 24.* Professor SNYDER. (Office hour, 9, *White 26.*)

S 3. Trigonometry. Daily, 8. *White B2.* Dr. CLARKSON. (Office hour, 9, *White B4.*)

S 5a. Analytic Geometry and the Calculus. (First term's work). Daily, 8 and 11. *White 21.* Assistant Professor LAWRENCE. (Office hour, 9, *White 23.*)

S 5b. Analytic Geometry and the Calculus. (Second term's work). Daily 8 and 11. *White 28.* Professor SHARPE. (Office hour, 9, *White 29.*) *White 5.* Assistant Professor AGNEW. (Office hour, 9, *White 8.*)

S 20. Teacher's Course. Credit two hours. Daily except Sat., 9. *White 10.* Professor CARVER. (Office hour, 8, *White 12.*)

The course will treat certain selected topics in the algebra and geometry of the secondary school curriculum; such as the number system, the meaning and existence of solutions of equations and sets of equations, geometry as a logical system, and constructions with ruler and compasses.

ADVANCED COURSES

S 24. Theory of Equations. Credit three hours. Daily, 9. *White 25.* Professor HUTCHINSON. (Office hour, 10, *White 26.*)

Solutions of the cubic and quartic; the theorems of Sturm and Budan, Newton's method, symmetric functions, determinants and eliminants. Textbook: Dickson's *Elementary Theory of Equations*.

S 42. Advanced Calculus. Credit three hours. Daily, 12. *White 1.* Professor GILLESPIE. (Office hour, 10, *White 3.*)

A study of the processes of the calculus; definitions and properties of limits, continuity, derivatives, and integrals.

S 45. Functions of a Complex Variable. Credit three hours. Daily, 11. *White 6.* Professor HURWITZ. (Office hour, 10, *White 8.*) Prerequisite Mathematics 4b or the equivalent.

An introductory course on single-valued analytic functions, chiefly from the standpoint of Cauchy and Riemann.

S 61. Projective Geometry. Credit three hours. Daily 10. *White 10.* Professor CARVER. (Office hour, 8, *White 12.*)

The elements of projective geometry will be studied by synthetic methods. Although no knowledge of mathematics beyond plane geometry will be presupposed, additional training and experience are highly desirable.

S 62. Advanced Analytic Geometry. Credit three hours. Daily, 8. *White 24.* Professor SNYDER. (Office hour, 9, *White 26.*)

Homogeneous point-coordinates and line-coordinates will be defined for a plane, and projective properties of plane figures will be studied by means of these coordinate systems.

READING AND RESEARCH COURSES

In addition to the preceding courses, opportunities are offered to graduate students to participate in informal work by reading and research under the direction of members of the Department of Mathematics. A regularly registered student may, by arrangement, obtain academic credit for any of this work; the number of hours of credit will depend on the amount of work done. Students interested in such directed reading or research may consult any of the following: Professors HUTCHINSON, SNYDER, SHARPE, HURWITZ, CARVER, GILLESPIE, Assistant Professors AGNEW and LAWRENCE.

S 100. Topics in Algebra.

S 100. Topics in Analysis.

S 100. Topics in Geometry.

S 100. Topics in Applied Mathematics.

MUSIC

S 1. Theory and Practice of Music. Credit two hours. Daily except Sat., 11. *Music Building, 320 Wait Avenue.* Assistant Professor HAIGH.

An elementary course in the theory of music, including notation and terminology, scale, interval, and chord structure, melody writing, ear training, sight singing, and the elements of musical design. Primarily for underclassmen, but open to all students who have had little or no training in music. Students offering music for entrance credit may not take this course for credit.

S 5A Art of Music. Credit two hours. Daily except Sat., 10. *Music Building, 320 Wait Avenue.* Professor WEAVER.

An approach to the rational understanding and enjoyment of the art of music. This part of the course covers the work of the first term of the regular academic year.

S 10A. History of Music. Credit two hours. Daily except Sat., 12. *Music Building, 320 Wait Avenue.* Professor WEAVER.

An illustrated course giving a survey of the evolution of the art of music, with particular reference to questions of style and to the place of music in the artistic and social life of nations. This part of the course covers the development of music from its beginnings to the period of Bach and Handel.

S 12 B. Historical Survey of Piano Music. Credit two hours. Daily except Sat., 9. *Music Building, 320 Wait Avenue.* Assistant Professor HAIGH.

An illustrated course giving a survey of piano music. Technical proficiency on the piano is not required. This part of the course deals with the romantic and modern periods.

S 20A. Harmony. Credit two hours. Daily except Sat., 8. Prerequisite Music 1 or its equivalent. *Music Building, 320 Wait Avenue.* Assistant Professor SMITH.

A course dealing with the construction and interconnection of triads and their inversions, with chords of the seventh and their inversions, and with the harmonizing of both bass and soprano melodies.

S 60. Applied Music. Individual instruction in organ and piano. Credit two hours for students majoring in music; for other students, no credit. Hours to be arranged. *Music Building, 320 Wait Avenue.* Assistant Professors HAIGH and SMITH.

This course is offered primarily for students wishing to major in music; and in such cases the work of the course is correlated with the theoretical courses being pursued by the student. Whenever the facilities of the department permit, other students are allowed to register for this work without credit. Permission to register, whether with or without credit, should be obtained from Professor WEAVER.

Individual instruction is offered in organ under Professor SMITH, and in piano under Professor HAIGH. Facilities for practice are available in each case. After obtaining permission to register for the work, students should consult the instructor about hours of instruction, and the secretary of the department about hours of practice.

Special fees are charged for this instruction and for the use of practice facilities. Information may be obtained from the secretary of the department.

S 61. Applied Music. A continuation of Course S 60, open to students who have completed that course or its equivalent. See S 60 for conditions and regulations applying also to S 61.

PHILOSOPHY

S 1. Philosophies of Life. Credit two hours. Daily except Sat., 9. *GS 225.* Assistant Professor SMART.

A study of some typical theories of human conduct, ancient and modern, in relation to contemporary problems of social organization, education, and the like.

S 2. Problems of Philosophy. Credit two hours. Daily except Sat., 11. *GS 225.* Assistant Professor SMART.

An introduction to certain problems concerning morals, beauty, and truth, as they arise in common human experience and scientific investigations.

PHYSICAL AND HEALTH EDUCATION

S 12. Gymnastics. (Women) Daily except Sat., 12. *Sage Gymnasium.* Miss THORIN.

In this course the modern trends of gymnastics will be explained and practice will be given in Danish as well as in Finnish, Swedish, and German Gymnastics.

S 13. Playground Activities and Adult Recreation. (Men and Women.) Daily except Sat., 2. *Sage Gymnasium.* Miss THORIN.

It is the purpose to provide explanation of and practice in a considerable number and variety of games suitable for gymnasium and playground. The adaptation of games to various ages and local conditions will be considered. Folk dancing, social dancing, and campcraft.

Prospective camp councillors, social workers, and scout leaders are recommended to register for this course.

S 14. Folk and Tap Dancing. (Women.) Daily except Sat., 3. *Sage Gymnasium.* Miss THORIN.

Folk dances of various nationalities will be taught, also clogs, jigs, and athletic dances.

S 15. Interpretative Dancing. (Women.) Daily except Sat., 4. *Sage Gymnasium.* Miss THORIN.

Fundamental body movements with illustration of typical rhythms of the Dalcroze school and of various Germans, Rudolf Bode, Paul Bekker, Ernst Ferland-Freund, Hedvig Hagemann, Rudolf Von Laban, and Mary Wigman. This course will offer an opportunity for musical interpretation and pantomimic dancing, festival and pageant work.

S 16. Swimming. (Women.) Daily except Sat., at hours to be arranged. *Old Armory Pool.* Miss THORIN.

Beginning and advanced swimming, diving, and Red Cross life saving.

For this course a special charge of ten dollars is made.

S 18. Tennis. For Men and Women. 9-12:30, 2-5. *Risley and Sage Courts.* Mr. MURRAY and Mr. TERENTIEFF.

Instruction in the fundamentals of tennis, either individually or by pairs. For a series of ten lessons a special charge of ten dollars is made.

HYGIENE AND HEALTH EDUCATION

S 1. Hygiene of the School Child and Adolescent. Credit two hours. Daily except Sat., 8. *Stimson.* Dr. SMILEY.

The principles of personal hygiene with a discussion of such major health problems of childhood as nutrition, posture, the care of eyes and teeth, sex hygiene, mental hygiene, exercise and recreation.

S 2. Home and Community Hygiene. Credit two hours. Daily except Sat., 11. *Stimson.* Dr. EVANS.

The hygiene of the home; the control of health hazards in community environment; the community attack on tuberculosis and mental disease; community problems in infant hygiene, school hygiene, industrial hygiene; the history and development of public health work.

S 3. School Health Supervision. (Health Inspection and Mental Hygiene). Credit two hours. Daily except Sat., 10. *Stimson.* Dr. EVANS.

The first fifteen periods of this course will be devoted to the technique of the physical inspection of school children, with interpretation of the findings. The last fifteen periods of the course will be devoted to the problems of nervousness and emotional instability in the school child, and to the principles of mental hygiene.

S 4. The Principles of Health Education. Credit two hours. Daily except Sat., 9. *Stimson.* Dr. SMILEY. Prerequisite S 1 or its equivalent.

The place of health education in the field of public health and in the field of education; the school health program; special problems in health-habit training; physical education, sex education, safety education; the gradation of hygiene subject matter; the evaluation of health teaching methods and devices; the problem of obtaining cooperation between home and school.

PHYSICS

Demonstration Lectures. A series of experimental demonstrations covering the entire field of physics. Little time will be spent on the development of the related theory, this being left for the classroom work of courses S 3-S 12, of which these lectures are a part. Teachers may find in these demonstrations valuable suggestions for their own work.

Mechanics, sound, and light, M W F, 9; heat, magnetism, and electricity, T Th S, 10. Assistant Professors COLLINS and GRANTHAM.

S 3, S 11. **Introductory Experimental Physics.** Credit three hours and four hours respectively. Demonstration lectures, recitations, and laboratory work covering mechanics, sound, and light. A computing period of three hours is also included for S 11.

Lectures, M W F, 9. *Rockefeller A.* Recitations, T Th S, 9; written quiz, Th, 12. *Rockefeller 105.* S 11 computing period, W, 1:40-4:30. *Rockefeller 252.* S 11 laboratory, T Th F, 1:40-4:00. *Rockefeller 252.* Assistant Professor GRANTHAM. Fee, \$5. S 3 laboratory, T Th, 1:40-4:00. *Rockefeller 220.* Assistant Professor COLLINS. Fee, \$5.

S 4, S 12. **Introductory Experimental Physics.** Credit three hours and four hours respectively. Demonstration lectures, recitations, and laboratory work covering heat, magnetism, and electricity. Three computing periods are also included for S 12.

Lectures, T Th S, 10. *Rockefeller B.* Recitations, M W F, 10; written quiz, M, 12. *Rockefeller 103.* S 12 computing periods, T W F, 12. *Rockefeller 103.* S 4 laboratory, W F, 1:40-4:00. *Rockefeller 220.* Assistant Professor COLLINS. Fee, \$5. S 12 laboratory, T W Th, 1:40-4:00. *Rockefeller 252.* Assistant Professor GRANTHAM. Fee, \$5.

S 22. **General Physics.** Credit three hours. Prerequisite Physics 11 and 12 and Mathematics 5a and 5b.

Theory, problems, and laboratory on thermionic emission, photoelectricity, photometry, and special topics in light and heat.

Recitations, daily except Sat., 11. *Rockefeller 104.* Professor KENNARD. Laboratory, two afternoons as arranged. *Rockefeller 252.* Assistant Professor GRANTHAM. Fee, \$2.50.

S 60. **Physical Experiments.** Credit one to three hours. Prerequisite Physics 3 and 4 and Mathematics 3 or their equivalent. Laboratory work in mechanics, properties of matter, heat, sound, light, electricity. For students of less experience physical principles will be emphasized; for those of more experience either in physics or in mathematics opportunity will be given to study methods of measurements, sources of error, the adjustment and use of instruments of precision, and graphical methods of interpreting results. The instruction is individual and will be adjusted to meet the needs of each student. Laboratory open daily except Sat., 8-12. *Rockefeller 352.* Professor GIBBS. Fee, \$2.50 a credit hour.

S 90. **Teachers' Course.** Credit two hours. Lectures and discussions. Daily except Sat., 8. *Rockefeller 107.* Assistant Professor HOWE.

This course is intended for teachers in secondary schools. Students taking the course will be expected either to have had teaching experience in Physics, to have completed the equivalent of Physics S 3 and Physics S 4, or to elect the work of these courses in conjunction with Physics S 90.

The selection of subject matter, its organization and presentation, derivation of formulae and analysis of problems, the selection of apparatus for classroom and laboratory.

Personal conferences will be arranged for the discussion of teachers' problems. Teachers are advised to bring with them a copy of the textbook they are using. A critical study of an introductory textbook will be made.

S 106. **Advanced Laboratory Practice.** Open to students who have had Physics S 60 or its equivalent. Credit varies with the amount of work done. The laboratory is open daily except Sat., 9-1. *Rockefeller 301.* Professor GIBBS and Assistant Professor SMITH. Fee, \$5 a credit hour.

In this course each student will work independently on a group of experiments selected to meet his own needs and interests. Apparatus and equipment are available for work in a variety of fields, including such experiments as the measurement of the ionization potentials of vapors, the charge and ratio of charge to mass of the electron, the study of photoelectric and thermionic emission, high vacuum technique, the characteristics of vacuum tubes, emission and absorption spectra of x-rays, the Raman effect, spectral terms and series, spectra from atoms in various stages of ionization and methods of their excitation, solar spectra, interferometry, the impedance bridge and the frequency bridge.

The sequence of courses S 111 to S 140 is intended to run through three summer sessions. The schedule for the next three summers is: 1934, S 112 and S 121; 1935, S 122 and S 140; 1936, S 111 and S 130. The courses are of the same general character as the corresponding courses given in the fall and spring terms but include somewhat fewer topics. The selection of these topics will be influenced by the interests and needs of the class. To profit by these courses a student should have a knowledge of calculus and should have completed courses in general physics covering the principal topics of the subject. A student who contemplates electing any of these courses is advised to correspond with Professor Gibbs about his preparation for the work. These courses, as also S 106, S 400, S 415, and S 500, may be taken for credit toward an advanced degree in Physics, subject to the requirements of the graduate school. See the *Announcement of the Graduate School*.

[S 111. **Mechanics.** Credit two hours. An introductory study of analytical mechanics and terrestrial and universal gravitation based upon Jean's *Theoretical Mechanics*.] Not given in 1934.

S 112. **Properties of Matter.** The analysis of stresses and strains and some applications, surface tension, the motion of fluids and the effects of viscosity. Text: McEwen, *Properties of Matter*. Daily except Sat., 12. *Rockefeller* 104. Professor KENNARD.

S 121. **Electricity and Magnetism.** Electrostatic and magnetic fields, direct current phenomena, gaseous, electrolytic, and metallic conduction, chemical and thermal electromotive forces. Text: Page and Adams, *Principles of Electricity*. Daily except Sat., 8. *Rockefeller* 103. Assistant Professor SMITH.

[S 122. **Electricity and Magnetism.** Electromagnetism, variable currents, electric oscillations. Text: Page and Adams, *Principles of Electricity*.] Not given in 1934.

[S 130. **Light.** Geometrical optics, thick lenses and lens systems, optical instruments. Physical optics, interference, diffraction, polarization. Text: Houston, *Treatise on Light*.] Not given in 1934.

[S 140. **Heat.** A general discussion based upon Edser's *Heat*, with particular attention to the application of kinetic theory and thermodynamics.] Not given in 1934.

S 400. **Modern Applications of Thermodynamics.** Prerequisite thorough general courses in physics and calculus. Daily except Sat., 11. *Rockefeller* C. Professor EPSTEIN.

Brief summary of the foundations of thermodynamics, Nernst's heat theorem, chemical constants of gases, theory of degenerate gases of Fermi-Dirac and Einstein-Bose, the electron gas with applications to astrophysics and thermionics, equilibrium of radiation and matter, limits of the validity of the laws of thermodynamics.

S 415. **Special Topics for Investigation.** Students who are prepared to profit by the use of the library and laboratory facilities of the Department in the study of some special topic or in investigation will be given an opportunity to do so. This work may be taken in connection with or independently of any of the above courses and will be under the direction of one or more members of the staff, with whom frequent conferences should be arranged. Credit varies with the nature and amount of work done. Students interested are advised to correspond with Professor GIBBS.

S 500. Selected Topics. Two or three meetings each week at hours to be arranged. Professor EPSTEIN.

A discussion of statistical mechanics and its relation to thermodynamics, especially from the point of view of wave dynamics.

Seminary. Reports and discussions of recent work in Physics. M, 2:30. Rockefeller C.

PHYSIOLOGY AND BIOCHEMISTRY

BEHAVIOR

S 1. The Biological Basis of Behavior. Credit two hours. Daily except Sat., 9. *Stimson Amphitheatre.* Professor LIDDELL.

The course will include a discussion of those methods and results of contemporary physiology which further the understanding of behavior. Special emphasis will be placed upon the integrative action of the neural and humoral systems. The derivation and present significance of those biological concepts commonly employed in psychology, sociology, and education will be considered at length as a preparation for the analysis of contemporary theories of behavior.

S 2. The Conditioned Reflex. Credit two hours. Daily except Sat., 10. *Stimson Amphitheatre.* Professor LIDDELL.

This course has two purposes: *viz.*, to acquaint the student with the factual basis of the conditioned reflex theory; and to examine critically the applications of this theory to human behavior, particularly in the field of education.

Both courses (S 1 and S 2) will be illustrated by frequent experimental demonstrations on animal and human subjects and by moving pictures. Previous study of biology is desirable but not required. Students who have completed S 1 and S 2, or have equivalent preparation, may undertake experimental investigation or systematic reading in the experimental literature for credit (S 3).

S 3. Advanced Work and Research in Behavior. Hours and credit to be arranged. Professor LIDDELL.

Opportunities for experimental investigation of behavior will be available to properly qualified students. Detailed study of the experimental literature may also be pursued for credit.

S 4. Recent Russian Contributions to Behavior Study. No credit. Time of meeting to be arranged. Professor LIDDELL.

Informal discussion of contemporary experimental studies of human and infra-human behavior in the U.S.S.R.

PSYCHOLOGY

S 1. Psychology. Credit two hours. Lectures and recitations, daily except Sat., 9. *GS C.* Assistant Professor JENKINS.

A general introduction to the psychological study of man from the experimental point of view. The course opens with a brief discussion of the nature of psychology, of the problems which psychology is called upon to face, and of the methods at its disposal for their solution. It then sets forth in order the facts and principles of psychological function. Textbook: Bentley, *The New Field of Psychology*.

S 2. Social Psychology. Credit two hours. Lectures, readings, and discussions, daily except Sat., 11. *Morrill 42.* Professor WELD.

An investigation from the psychological point of view of the relation between individuals, the nature of social groups, and their influence upon each other. The attempt will also be made to find the relation between social psychology and certain aspects of Education, Sociology, Social Anthropology, Jurisprudence, and History. Textbook: Murphy, *Experimental Social Psychology*.

S 3. Applications of Psychology. Credit two hours. Daily except Sat., 8. *Morrill 59.* Assistant Professor JENKINS.

A critical interpretation of the attempt to apply the facts and methods of psychology to the solution of problems in vocational selection, in industry, in advertising and selling, and in other technological fields. Readings assigned in standard journals and books.

S 4. Contemporary Schools of Psychology. Credit two hours. Lectures and recitations, daily except Sat., 9. *Morrill 42.* Professor WELD.

An exposition of the current schools of psychology. The historical derivation of present doctrines and points of view. The significance of Behaviorism, Psychoanalysis, Configurationism, Purposivism, and other recent proposals. By way of preparation the student should have had at least a sound introductory course in psychology. Textbook: Woodworth, *Contemporary Schools of Psychology*.

S 9. Graduate Seminary. Daily, by appointment. *Psychological Laboratory, Morrill Hall.* Professor BENTLEY.

Individual researches and informal study.

PUBLIC SPEAKING

DRAMATIC ART: SPEECH TRAINING: ORAL ENGLISH

All summer courses are planned to meet the special needs of teachers. Either S 3 or S 30 (not both) may be counted as a course in methods approved by the New York State Department of Education for the teachers' certificate.

Students should register with the individual instructors, who will be in their offices on registration day and on the first day of instruction. For further details about registration consult Mr. DRUMMOND, *GS 244*.

For information about advanced work in Speech Training and Phonetics consult Mr. THOMAS, *GS 23*; in Rhetoric and Public Speaking, Mr. WAGNER, *GS 237*; in Dramatic Production, Mr. DRUMMOND, *GS 244*, or Mr. STANTON, *GS 239*.

S 1. Public Speaking and Discussion. Credit two hours. Daily except Sat., 11. *GS 21.* Assistant Professor WAGNER.

Practice in discussion and in platform speaking, on topics of current interest. Methods of preparation and delivery studied in relation to practice; selected readings on contemporary problems; conferences. Regular students passing the course admitted to Public Speaking 2. (High school teachers will find the methods applicable to their work in public speaking and oral English.)

S 3. Teachers' Course in Oral English and Public Speaking. Credit two hours. Daily except Sat., 9. *GS 236.* Assistant Professor WAGNER.

Designed for secondary school teachers whose work includes oral English or public speaking. Aims and standards; organization of courses; methods and materials; conduct of speech activities. Examination of reports and syllabuses on oral English and public speaking in secondary schools. Individual conferences for special problems.

S 10. Oral Interpretation of Literature. Credit two hours. Two sections: daily except Sat., 10. *GS 21.* Assistant Professor THOMAS; daily except Sat., 12. *GS 236.* Assistant Professor WOHL.

Training in the interpretative reading of prose and poetry; study of principles; constant practice; conferences for drill. Mr. Thomas will give special attention to the reading of modern poetry; Mr. Wohl to the reading of dramatic dialogue from *Hamlet* and from a modern comedy.

S 21. Principles of Public Speaking. Credit two hours. Daily except Sat., 12. *GS 26.* Assistant Professor WAGNER.

For upperclassmen and graduates. Lectures, readings, reports, and discussions.

An introductory survey: social functions of speech; leading theories of public address: speech preparation, structure, style, delivery; principles of persuasion; problems of debate and group discussion.

S 30. Teachers' Course in Phonetics and Speech Training. Credit two hours. Daily except Sat., 9. *GS 26.* Assistant Professor THOMAS.

A study of English phonetics, pronunciation, and the improvement of speech, for secondary and elementary school teachers.

S 41. Dramatic Production. Credit two hours. Two sections: daily except Sat., 10. *GS B.* Assistant Professor WOEL; daily except Sat., 12. *GS B.* Assistant Professor STANTON.

Theory of stage direction; choice of plays; practical phases of production; one-act plays rehearsed; practice with the Summer Theatre. Students in S 41 should take S 10 or offer its equivalent.

S 45. Stagecraft. Credit two hours. Daily except Sat., 10, with additional laboratory hours to be arranged. Stage laboratory. *Morse.* Mr. Voss.

An elementary course in stage theory and practice; the planning of small theatres; design and construction of scenery; lighting; with attention to other contributory crafts and to the related principles of stage direction. Laboratory fee, \$5.

S 63. Principles of Voice Training and Speech Correction. Credit two hours. Hours to be arranged. *GS 23.* Assistant Professor THOMAS.

For students sufficiently prepared for independent work.

S 66. Dramatic Art. Credit two hours. Daily except Sat., 12. *GS 236.* Professor DRUMMOND.

For students having sufficient preparation for advanced work in the theory of dramatic production. Lectures, readings, and reports.

S 66B. Dramatic Production. Credit two hours. Hours to be arranged. Professor DRUMMOND.

Graduate students in Dramatic Production who are in their last term of required residence, or who are presenting theses during the session are required to register for this course.

S 90. Theatre Practice. Credit one hour if taken with S 41, S 45, or S 66. Hours to be arranged. Open by consent of instructor. Assistant Professor STANTON, assisted by the Summer Theatre Staff.

Two sections: S 90-A, **Stagecraft and Technical Stage Practice**; and S 90-B, **Stage Lighting**, for those who have had S 45 or S 90 or the equivalent. Either section may be taken for credit two summers.

Technical stage practice in connection with the regular productions of the Summer Theatre, supplementing the work of the regular courses in dramatic production.

The Summer Theatre. Director: Professor DRUMMOND; Assistant Director: Assistant Professor STANTON; assisted by Assistant Professor WOEL, Mr. Voss, Mr. ALBRIGHT, Mr. MOORE, Mr. CURVIN, Mr. SCANLAN, Mr. ANGUS, and Miss WORMAN.

During the Summer Session several performances will be given by the student repertory Summer Theatre Company. Members of the courses in Dramatic Production may compete for places in the casts of Summer Theatre plays. For this work they will register in the regular classes in Dramatic Production during the second week of the session.

Speech Clinic. For students working under the supervision of the Department of Public Speaking. By appointment. *GS 23.* Assistant Professor THOMAS.

ROMANCE LANGUAGES

FRENCH

S 1. Elementary Course. Credit four hours. Daily except Sat., 8 and 12. *GS 281.* Assistant Professor BISHOP. Entrance credit, one unit.

The object of this course is twofold: first, to give beginners a thorough drill in the essentials of French pronunciation, grammar, and reading; second, to offer to teachers an opportunity of studying the methods of presentation of these subjects to beginners.

S 3. Advanced Course. Credit four hours. Daily except Sat., 8 and 12. *GS 227.* Assistant Professor PELMONT.

Entrance credit, one unit. Prerequisite second year French.

S 4. Rapid Reading. Credit two hours. Daily except Sat., 9. *GS 283.* Assistant Professor BISHOP. Prerequisite course S 3 or its equivalent.

S 5. Elementary Composition and Conversation. Credit two hours. Daily except Sat., 11. *GS 283.* Prerequisite course S 3 or its equivalent. Assistant Professor PELMONT.

S 9. Advanced Composition and Conversation. Credit two hours. Daily except Sat., 10. *GS 281.* Assistant Professor PELMONT.

Rapid translation from standard English texts into French; frequent theme-writing. This course is conducted in French.

S 27. Contemporary French Drama. Credit two hours. Daily except Sat., 11. *GS 277.* Professor MASON.

Lectures and discussions of special topics, with extensive outside reading and reports.

S 47. French Seminary. Credit two hours. Daily except Sat., 9. *French Seminary Room, Library.* Professor MASON.

Discussion of special topics in the field of modern French literature. This course is especially for graduate students and candidates for the degree of Master of Arts.

French Lectures. A series of lectures in French dealing with French national life will be given by the members of the instructing staff on Wednesday evenings at 8 o'clock in *Goldwin Smith Hall*, Room 290.

French Conversation. In *Prudence Risley Hall* special tables are arranged under competent supervision for conversation in French.

SPANISH

S 1. Course for Beginners. Credit four hours. Daily except Sat., 8 and 12. *GS 277.* Professor DALE.

Entrance credit, one unit.

S 10. Spanish Literature. Credit two hours. Daily except Sat., 10. *GS 277.* Professor DALE.

The life, history, literature, and art of Spain as portrayed by Spanish writers. Lectures, readings, classroom discussions.

S 30. Spanish Seminary. Credit two hours. M W F, 11 or hours to be arranged. *Romance Seminary Room, Library.* Professor DALE.

Discussion of special topics in the field of Spanish literature. Thesis subjects and related material for graduate students.

THE GRADUATE SCHOOL OF EDUCATION

OFFICERS

LIVINGSTON FARRAND, A.B., M.D., L.H.D., LL.D., President of the University.
ALBERT RUSSELL MANN, B.S.A., A.M., D.Sc., D.Agr., LL.D., Provost of the University.
JULIAN EDWARD BUTTERWORTH, Ph.D., Director of the Graduate School of Education.
RIVERDA HARDING JORDAN, Ph.D., Chairman of the Summer Session.
ROLLAND MACLAREN STEWART, Ph.D., Director of the New York State Summer Session at Cornell University.

STAFF OF INSTRUCTION

THOMAS LEVINGSTON BAYNE, jr., Ph.D., Assistant Professor of Rural Education.
CORA E. BINZEL, M.S., Professor of Rural Education.
JULIAN EDWARD BUTTERWORTH, Ph.D., Professor of Rural Education and Director of the Graduate School of Education.
THEODORE HILDRETH EATON, Ph.D., Professor of Rural Education.
EMERY NELSON FERRISS, Ph.D., Professor of Rural Education.
FRANK H. FINCH, Ph.D., Director of Guidance, University High School, University of Minnesota.
FRANK SAMUEL FREEMAN, Ed.D., Assistant Professor of Education.
ARTHUR K. GETMAN, D.Sc., Chief, Agricultural Education Bureau, New York State Department of Education. (July 9 to 20).
EVA L. GORDON, M.S., Assistant in Rural Education.
EDWIN RAY HOSKINS, Ph.D., Assistant Professor of Rural Education.
M. LOVELL HULSE, Ph.D., Instructor in Education and Secretary of the Bureau of Educational Service.
MARGARET HUTCHINS, M.A., Supervisor of Home Economics Education, New York State Department of Education.
RIVERDA HARDING JORDAN, Ph.D., Professor of Education and Chairman of the University Summer Session.
HORACE KIDGER, LL.B., Head of Department of Social Studies, High School, Newton, Massachusetts.
PAUL J. KRUSE, Ph.D., Professor of Rural Education.
CLAUDE L. KULP, M.A., Superintendent of Schools, Ithaca, N. Y.
ELLWOOD A. LAFORTUNE, M.A., Director of Guidance in the Secondary Schools, Vice-Principal of the Senior High School, Ithaca, N. Y. (July 9-20).
CLYDE B. MOORE, Ph.D., Professor of Rural Education.
J. CAYCE MORRISON, Ph.D., Assistant Commissioner for Elementary Education, New York State Department of Education. (August 6 to 17).
ROBERT MORRIS OGDEN, Ph.D., Professor of Education and Dean of the College of Arts and Sciences.
E. LAURENCE PALMER, Ph.D., Professor of Rural Education.
W. HOWARD PILLSBURY, A.B., Superintendent of Schools, Schenectady, N. Y.
ROLLAND MACLAREN STEWART, Ph.D., Professor of Rural Education and Director of the New York State Summer Session.
MARION S. VAN LIEW, B.S., Chief, Home Economics Education Bureau, New York State Department of Education.
ANDREW LEON WINSOR, Ph.D., Assistant Professor of Rural Education.

The Graduate School of Education is composed of the Department of Education in the College of Arts and Sciences and the Department of Rural Education in the College of Agriculture. The Department of Education functions as a part of the University Summer

Session and the Department of Rural Education is organized under the New York State Summer Session. Tuition fees are charged in accordance with the scale explained on page 13.

THE PRINCIPALS' CERTIFICATES

The State Department of Education has approved curricula for the training, at Cornell University, of persons for the various types of principalships. Usually it should be possible for the student who is matriculated in the Graduate School to satisfy the requirements for a Master's degree in Education at the same time that he is completing the program for a principal's certificate. The student who is already matriculated should consult the chairman of his special committee. Others should confer with the Director of the Graduate School of Education.

DEPARTMENT OF EDUCATION

Courses S 1, S 2, S 4, and S 13, will be found especially helpful by college graduates who are preparing to meet the requirements for the New York State College graduate provisional certificate. Information regarding certificate requirements in New York and other states may be had by consulting Professor R. H. JORDAN, Goldwin Smith Hall 252, either in person or by letter.

The following courses may not be taken for graduate credit except with the approval of the instructor and the chairman of the student's special committee: S 1, S 2, S 13, S 4, S 20.

S 1. Educational Psychology. Credit two hours. Daily except Sat., 11. GS 256. Professor OGDEN.

A course in *Gestalt* psychology as applied to the process of Education. Main topics: Original nature of behavior, experience of behavior, improvement of behavior. Textbook: Ogden and Freeman, *Psychology and Education*.

S 2. Principles of Secondary Education. Credit two hours. By extra work an additional hour of credit may be earned by a student in the New York State Summer Session who needs three credits for certification purposes. Daily except Sat., 12. Stone 203. Mr. PILLSBURY.

The nature and significance of education; biological and psychological foundations; the secondary school in a democratic society; educational values.

S 4. Secondary School Methods. Credit two hours. Daily except Sat., 10. GS 256. Dr. HULSE.

A study of the principles underlying vital instruction in its intellectual, emotional, and motor phases; types of subject matter; special teaching procedures; the use of supplementary devices; motivation; lesson assignment; questioning; the art of study; supervised study; tests and examinations; lesson planning; class management.

S 5. High School Administration. Credit two hours. Daily except Sat., 11. GS 227. Mr. PILLSBURY.

Problems in the administration of the school building as a unit, in contrast to the administration of an entire school system.

S 6. Philosophy of Education. Credit two hours. Daily except Sat., 11. GS 124. Professor EATON.

Intended for graduate students who by study or experience are well advanced in knowledge of education.

S 7. Mental Measurements. Credit three hours. With the consent of the instructor, this course may be taken, without laboratory, for two hours' credit. Lectures, prescribed readings, and laboratory. Daily except Sat., 9. GS 227. Assistant Professor FREEMAN.

Nature of intelligence. History of the development of individual and group tests of intelligence; principles underlying their construction. Their use in the schools and in fields outside the schools. The use of educational tests with intelligence tests in school problems. Demonstrations in administering tests.

S 9. Research. Credit as arranged. Members of the staff of the Department of Education.

This course provides opportunity for those working on theses or other research projects to register for credit. Previous arrangements must be made with the staff members concerned.

S 10. Problems in High School Administration. Credit two hours. T Th, 1:40-4. *GS 227.* Professor JORDAN.

An advanced course in high school administration, dealing with problems peculiar to the administration of secondary schools. The course presupposes preliminary courses including administration, curriculum, and supervision. The materials are so arranged in a three-year cycle as to give graduate students a continuous three-year course. These cycles are: I. Organization and Management of the Building, 1934; II. The Teaching Staff, 1935; III. The Pupil; and the Public, 1936.

Students may enroll in any unit of this course; and particular attention is given to the needs of the group. Permission of the instructor must be obtained before enrollment. Papers and reports required.

S 11. Extra-Classroom Activities. Credit two hours. Daily except Sat., 8. *GS 256.* Professor JORDAN.

A study of the place extra-classroom activities should assume in the school program. General principles involved, with special attention to athletics, dramatics, publications, school finance, music, debate, and school clubs. Individual problems of the class will have special attention.

S 12b. The Problem Child. Credit two hours. Daily except Sat., 11. *GS 134.* Assistant Professor FREEMAN.

A study of atypical children. Implications for education.

Students who have not had or who are not now taking a course in mental and educational measurement may be admitted only on the approval of the instructor.

S 13. History of American Education. Credit two hours. Daily except Sat., 9. *GS 256.* Dr. HULSE.

A survey of educational change in the United States from the beginning of the seventeenth century to the present, with special emphasis on public schools, and with consideration of the religious, economic, political, and social factors affecting education. European influences throughout the period will also be considered briefly.

S 20. Observation and Practice in High School Method. Credit one to three hours. Hours to be arranged. *GS 251.* Dr. HULSE.

This course is limited to students needing credit in practice teaching to meet specific state requirements. Application must be made before June 1 to Dr. M. L. Hulse, 251 Goldwin Smith Hall, Ithaca, N. Y. The work will involve daily observation and practice in the Ithaca High School Summer Session under supervision of selected teachers and under the general direction of the Department of Education. Frequent conferences will be held with the instructor in charge.

S 21. Aesthetic Education. Credit two hours. M W F, 2-3:30. *GS 236.* Professor OGDEN.

A consideration of the aesthetic aspects and place of the fine arts in Education, with special reference to the psychological nature of music, literature, drawing, painting, and sculpture.

S 28. Educational and Vocational Guidance. Credit two hours. Daily except Sat., 10. *GS 134.* Dr. FINCH.

A study of the larger aims and problems of guidance in secondary education; of the present status and trends in the guidance movement; of the guidance agencies and resources and methods of utilizing them; of school organization and curricular adjustments appropriate to the ends of guidance, etc.

S 29. Analysis of the Individual and Counseling. Credit two hours. Daily except Sat., 2. *GS 227.* Dr. FINCH.

Designed to consider the problems and techniques of individual analysis and the work of the counselor.

S 30. Teacher's Course in Social Studies in the Senior High School. Credit two hours. Daily except Sat., 12. *GS 225.* Mr. KIDGER.

This course considers the content and method of teaching social studies in the senior high school. The interrelation of geography, history, and civics will be emphasized. Especial attention will be given to the most effective methods not only in presenting American history but also in dealing with problems of democracy. A consideration of individual method of measurements, and effective methods of testing, the use of outside reading, maps, charts, diagrams, notebooks.

S 263. Procedures and Techniques in Supervision. Credit two hours. Daily except Sat., 9. *GS 134.* Professor MOORE.

Designed for superintendents, supervisors, and principals. Inexperienced students admitted only by permission. A consideration of the nature and purpose of supervision; the improvement of the learning-teaching process; skill in observation; analysis of methods; relationships between general and specific objectives; selection, analysis, and organization of subject matter; measuring and testing results; assisting teachers in professional growth.

S 276. Principles of Curriculum Building. Credit two hours. Daily except Sat., 12. *East Roberts 232.* Professor FERRISS.

A consideration of major problems, principles, and techniques in determining educational objectives and curriculum content and organization in elementary and secondary schools in the light of modern educational theory and practice. Selected examples of recent courses of study and curriculums will be critically examined.

ADDITIONAL COURSES IN EDUCATION

TEACHERS' COURSES IN HIGH-SCHOOL SUBJECTS

The following courses are offered for teachers desiring to study problems of instruction in different high-school subjects. The courses are planned also to meet the requirements of the New York State Department of Education in the issuance of the College Graduate Life Certificate.

TEACHERS' COURSE IN ENGLISH. See English S 5.

TEACHERS' COURSE IN HISTORY. See History S 17.

TEACHERS' COURSE IN SOCIAL SCIENCE. See Education S 30.

TEACHERS' COURSE IN HEALTH EDUCATION. See Health Education S 4.

TEACHERS' COURSE IN LATIN. See Latin S 1.

TEACHERS' COURSE IN MATHEMATICS. See Mathematics S 20.

TEACHERS' COURSE IN PHYSICS. See Physics S 90.

TEACHERS' COURSES IN SCIENCE. See Rural Education S 107a, S 226.

TEACHERS' COURSES IN PUBLIC SPEAKING. See Public Speaking S 3, S 30.

DEPARTMENT OF RURAL EDUCATION

All courses numbered 200 or above and courses S 6, S 28, and S 29 are intended primarily for graduate students. Those who do not hold a Bachelor's degree should, therefore, secure the approval of the instructor before registering for any of these courses.

EDUCATIONAL PSYCHOLOGY AND MEASUREMENT

S 111a. Psychology for Students of Education. Credit two hours. Daily except Sat., 9. *East Roberts 232.* Assistant Professor BAYNE.

A point of view in psychology for students of education. The nature of man with emphasis on the tendencies to behavior basic to learning. The learning process; individual differences.

S 116. Child Psychology. Credit two hours. Daily except Sat., 10. *Stone 102.* Professor KRUSE.

Prerequisite 111, 112, S 111a, or equivalent. Students offering an equivalent are requested to confer with the instructor before registration. This course may be taken in lieu of 116 given during the regular year.

S 150. Introduction to Educational Measurement. Credit two hours. Daily except Sat., 11. *Stone 102.* Assistant Professor BAYNE.

Principles of measurement developed in relation to educational problems.

S 212. Psychology of Learning. Credit two hours. M, W, F, 7:30-8:50. *Stone 309.* Professor KRUSE.

For students who have had an elementary course in psychology and wish to extend their study of the learning process.

S 215. Psychology of Adolescence. Credit two hours. Daily except Sat., 10. *Agricultural Economics 240.* Assistant Professor WINSOR.

A study of the behavior of children during the adolescent stage of development. An elementary course in psychology is a prerequisite.

S 217. Psychological Tests in Guidance. Credit two hours. Daily except Sat., 8. *Stone 203.* Assistant Professor WINSOR.

A study of testing and rating devices designed as an aid in vocational selection.

EDUCATIONAL METHOD

S 107a. The Teaching of Nature Study and Elementary Science. Credit two hours. Lectures, M, W, F, 10. *Fernow 8.* Field and laboratory work, T, Th, 10-12:30 or 1:40-4. Professor PALMER and Miss GORDON.

To acquaint teachers with the principles and methods of education through nature study and elementary school science. Provision will be made through laboratory and field experience for consideration of the biological and physical science commonly found in representative elementary school programs in these fields. Laboratory and field work open only to those taking the work for credit.

S 132j. Special Problems in Guidance in Relation to Agriculture. Credit one hour. Daily except S., 7:30-9, July 9-20. *East Roberts 232.* Dr. GETMAN.

A study designed for teachers of vocational agriculture who expect to give instruction in guidance for pupils in Grade Nine. The course deals with a study of the opportunities, required abilities, income and educational requirements of occupations in the field of agriculture; try-out activities in supervised practical work; the coordination of the study of agricultural occupations with other guidance activities; organization and teaching problems in agriculture for ninth grade pupils; and the guidance of pupils in the choice of a curriculum. Open only to students enrolled in Course S 132m.

S 132k. The Organization and Teaching of Adult and Part-time Groups. Credit one hour. Daily except Sat., 7:30-9, July 23-August 3. *East Roberts 232.* Assistant Professor HOSKINS.

A special unit course on procedures of locating, recruiting, organizing, and planning instruction and follow-up work for adult and part-time groups.

S 132l. The Training of Teachers for Pupil Placement in Farming Situations. Credit one hour. Daily except Sat., 7:30-9, August 6-17. *East Roberts 232.* Assistant Professor HOSKINS.

An analysis of the factors to be considered in the placement of pupils in actual farming situations. Case studies will occupy an important part of the discussion.

S 132m. The Guidance of Secondary Pupils. Credit one hour. Daily except S., 10:30-12:30, July 9-20. *Plant Science 143.* Mr. LAFORTUNE.

A unit course for teachers of agriculture: the need, the organization of the program, and the agencies of guidance; how to make guidance functional. More emphasis will be placed upon concrete illustrations selected from actual school situations, and less upon theory. Case studies, useful forms and techniques will be evaluated and modified. The duties of counselors and other guidance workers will be outlined.

S 133. The Teaching of Agriculture in the Secondary School. Credit one hour. Hours to be arranged. Assistant Professor HOSKINS.

Open only to students in 232.

S 142a. Organization and Methods of Teaching Industrial Arts. Credit two or three hours. Daily except Sat., 8. *Agricultural Economics Laboratory.* Mr. KULP. For a third hour of credit, consult the instructor.

A course required for certification to teach Industrial Arts Courses. It includes consideration of the point of view, aims and objectives, organization of materials and courses for small high schools; also of related subject matter, the management of the shop, including shop equipment and shop procedures.

Open to students of vocational education who are interested in the teaching of Industrial Arts.

S 173. Methods of Teaching Adult Classes in Home Economics. Credit two hours. Daily except Sat., 2. *Stone 203.* Miss VAN LIEW and Miss HUTCHINS.

Designed to consider the organization and promotion of adult classes, the building of units of work, and teaching methods.

S 226. The Teaching of Science in the Rural Secondary School. Credit two hours. Daily except Sat., 9. *Fernow 8.* Professor PALMER.

A comparative study of the programs and methods of teaching science in rural secondary schools; the functions of the recognized high school sciences such as general science, biological science, and physical science, together with consideration of problems associated with materials and equipment.

S 232. The Teaching of Agriculture in the Secondary School. Credit two hours. Lectures, M T Th F, 9, Laboratory, W, 1:40-4. *Stone 309.* Assistant Professor HOSKINS.

Designed for teachers of agricultural courses and for students preparing to teach such courses; also for supervisors of agricultural courses and for those preparing to be supervisors of agricultural education. The aims and objectives of vocational agriculture, the determination of courses from field studies and analysis, the selection of suitable materials and methods of teaching, and the relationship of the agricultural teacher to the other agencies of agricultural education in the community, constitute the main points. Students desiring to qualify for teaching agriculture in New York are referred to course S 133.

S 235. Creative Procedures in Teaching Home Economics in the Public Schools. Credit two hours. Daily except Sat., 11. *Stone 203.* Professor BINZEL.

A course for teachers, designed to develop intelligent appraisal of progressive methods and to engender creative procedures. Study of changing philosophies of Home Economics education. The building of programs to meet the needs of boys and girls in their individual environments. Extending the class-room walls: consideration of the use of the home, the school, and the community resources and activities, to vitalize teaching; consideration of agencies for the bettering and promotion of human relationships; revaluation of the scope of Home Economics and of teaching-procedures, in the light of social, economic, and cultural aspects of everyday living. Direction of voluntary research to enlarge breadth of vision and to qualify for desirable accomplishment in teaching.

S 249. Seminary in Home Economics Education. Credit two hours. Daily except Sat., 2. *Stone 309.* Professor BINZEL. Open to graduate students.

The course content will be adapted to the personnel of the class. This course is open to persons interested in developing plans for experiment and research, and persons who are in, or who are looking toward, supervisory and administrative or teacher-training positions.

S 250. Seminary in Agricultural Education. Open to students in Agricultural Education who are registered in S 194, S 232, or S 267a. Credit one or two hours. Credit one hour. M W F, 8; additional hour by special arrangement. *Roberts 292.* Professor STEWART.

Typical pieces of research in agricultural education. Individual problems will furnish the basis for discovering the principles involved in original studies.

EDUCATIONAL ADMINISTRATION AND SUPERVISION

S 169a. Administrative Problems of the Homemaking Teacher. Credit two hours. Daily except Sat., 10. *Stone* 203. Miss VAN LIEW and Miss HUTCHINS.

Designed to help teachers with major problems confronting them in the organization, administration, development, and promotion of the homemaking program in the school and the community. Consideration will be given to legislation affecting Home Economics education; to problems of installing and maintaining departments; methods of securing support; location and types of centers; pupil enrollment; the school lunch; the relation of these and other problems to each other and to the entire school program.

S 261. The Administration of Rural Schools. Credit two hours. Daily except Sat., 8. *Stone* 102. Professor BUTTERWORTH.

A general course in school administration dealing especially with the problems of country, village, and central schools. Individual attention will be given to those who are working in larger schools.

S 262b. The School Plant. Credit two hours. Daily except Sat., 10. *East Roberts* 232. Professor BUTTERWORTH.

Problems covering the planning, construction, measurement, and utilization of school buildings and their constituent units. Particular attention will be given to buildings in village and central rural school districts.

A course in general school administration and one in the curriculum should precede or accompany this course.

S 263. Procedures and Techniques in Supervision. Credit two hours. Daily except Sat., 9. *GS* 134. Professor MOORE.

Designed for superintendents, supervisors, and principals. Inexperienced students admitted only by permission. A consideration of the nature and purpose of supervision; the improvement of the learning-teaching process; skill in observation; analysis of methods; relationships between general and specific objectives; selection, analysis, and organization of subject matter; measuring and testing results; assisting teachers in professional growth.

S 266. The Supervision of Elementary School Subjects. Credit two hours. Daily except Sat., 11. *East Roberts* 232. Professor MOORE.

Designed for supervisors, elementary school principals, and superintendents. A consideration of important research studies which have a direct bearing upon the teaching and supervision of the elementary school subjects.

S 267a. The Administration of Vocational Agriculture. Credit two hours. Daily except Sat., 11. *Stone* 309. Professor STEWART.

A critical study of the organization and administration of vocational agriculture. Special emphasis will be given to federal and state relations under the National Vocational Education Act.

S 272a. New Problems in the Supervision of Rural Schools. Credit two hours. Twice daily except Sat., August 6-17. Dr. MORRISON. First meeting M, 9. *Roberts* 391.

Supervisory problems involved in the attainment of the cardinal objectives of elementary education. The relationship of state syllabuses to an activity curriculum. Ways and means of introducing unit teaching; criteria for its evaluation; trends in its development. The closer coordination of school, home, and community through this program. Specific supervisory problems facing the district superintendent. A philosophy of supervision.

This is a special unit course designed for district superintendents.

S 276. Principles of Curriculum Building. Credit two hours. Daily except Sat., 12. *East Roberts* 232. Professor FERRISS.

A consideration of major problems, principles, and techniques in determining educational objectives and curriculum content and organization in elementary and secondary schools in the light of modern educational theory and practice. Selected examples of recent courses of study and curriculums will be critically examined.

HISTORY AND PRINCIPLES OF EDUCATION

S 2. Principles of Secondary Education. Credit two hours. By extra work an additional hour of credit may be earned by a student in the New York State Summer Session who needs three credits for certification purposes. Daily except Sat., 12. *Stone* 203. Mr. PILLSBURY.

The nature and significance of education; biological and psychological foundations; the secondary school in a democratic society; educational values.

S 6. Philosophy of Education. Credit two hours. Daily except Sat., 11. *GS* 124. Professor EATON.

Intended for graduate students who by study or experience are well advanced in knowledge of education.

S 194. Education and Vocations. Credit two hours. Daily except Sat., 9. *Stone* 203. Professor EATON.

A study of vocational education from the point of view of a democratic theory of education.

Open to graduate students and to seniors who have had courses in educational psychology and in economics or sociology.

S 281. The High School in Rural and Village Communities. Credit two hours. Daily except Sat., 9. *Stone* 102. Professor FERRISS.

A course dealing with the basic problems of modern secondary education in its adaptation to rural and village conditions. Among the topics considered are: the scope and functions of secondary education; types of secondary school organization and their adaptation to rural and village conditions and needs; program of studies and curriculum organization and content; pupil guidance; extra-class activities, needed forms of extension work, etc.

EDUCATIONAL AND VOCATIONAL GUIDANCE

S 28. Educational and Vocational Guidance. Credit two hours. Daily except Sat., 10. *GS* 134. Dr. FINCH.

A study of the larger aims and problems of guidance in secondary education; of the present status and trends in the guidance movement; of the guidance agencies and resources and methods of utilizing them; of school organization and curricular adjustments appropriate to the ends of guidance, etc.

S 29. Analysis of the Individual and Counseling. Credit two hours. Daily except Sat., 2. *GS* 227. Dr. FINCH.

A course designed to consider the problems and techniques of individual analysis and the work of the counselor.

S 132j. Special Problems in Guidance in Relation to Agriculture. A unit course for teachers of agriculture. July 9-20. For description see page 49.

S 132m. The Guidance of Secondary Pupils. A unit course for teachers of agriculture. July 9-20. For description see page 49.

S 217. Psychological Tests in Guidance. For description see page 49.

RESEARCH

S 300. Research. Credit as arranged. Members of the staff of the Department of Rural Education.

Students working on theses or other research projects may register for this course. The staff members concerned must be consulted before registration.

SUMMER SCHOOL OF BIOLOGY

Under the auspices of the New York State Summer Session at Cornell University and the Summer Session of Cornell University.

The tuition fee in the Summer School of Biology, regardless of the number of courses taken, is sixty dollars.

STAFF OF INSTRUCTION

OTIS FREEMAN CURTIS, Ph.D.	Plant Physiology
(Professor of Botany)	
ARTHUR JOHNSON EAMES, Ph.D.	Plant Anatomy and Morphology
(Professor of Botany)	
HARRY MORTON FITZPATRICK, Ph.D.	Mycology
(Professor of Mycology)	
ALLAN CAMERON FRASER, Ph.D.	Genetics
(Assistant Professor of Plant Breeding)	
WILLIAM JOHN HAMILTON, JR., Ph.D.	Zoology
(Instructor in Zoology)	
RUSSELL P. HUNTER, Ph.D.	Zoology
(Assistant in Zoology)	
OSKAR AUGUSTUS JOHANNSEN, Ph.D.	Entomology
(Professor of Entomology)	
BENJAMIN FREEMAN KINGSBURY, Ph.D., M.D.	Histology and Embryology
(Professor of Histology and Embryology)	
ROBERT MATHESON, Ph.D.	Entomology
(Professor of Entomology)	
AMY GRACE MEKEEL, Ph.D.	Zoology
(Assistant in Zoology)	
LOREN CLIFFORD PETRY, Ph.D.	Paleobotany and Elementary Botany
(Professor of Botany)	
HUGH DANIEL REED, Ph.D.	General Zoology and Morphology
(Professor of Zoology)	
THEODORE SNOOK, Ph.D.	Histology and Embryology
(Instructor in Histology and Embryology)	
KARL MCKAY WIEGAND, Ph.D.	Plant Taxonomy
(Professor of Botany)	
BENJAMIN PERCY YOUNG, Ph.D.	Invertebrate Zoology
(Assistant Professor of Zoology)	
WILLIAM HARDY THARP, Ph.D.	Botany
(Instructor in Botany)	

GENERAL PLANS AND AIMS

The Summer School of Biology was organized to provide instruction of the highest grade in zoology, botany, and allied subjects. All the regular facilities of the University are at the disposal of the students, and as far as possible the staff has been restricted to teachers of professorial rank in the University. The courses are for the most part those given during the regular academic year condensed into a period of six weeks, but not abridged. The work is particularly planned to meet the needs of teachers and graduate students who wish to know, in addition to the subject matter, something of the methods and sources in teaching; but undergraduates also, if suffi-

ciently prepared, will find the courses adapted to their needs. Intensive rather than extensive work is necessarily expected of each student, as the courses are comprehensive. These courses lead toward advanced degrees, and special attention is given to graduate students pursuing research. Students interested in graduate study should, if possible, consult by letter with Professor K. M. Wiegand, representing the School of Biology, or with the professor concerned, before coming to Ithaca.

The intensive interest in Biology at Cornell University over a period of years has resulted in a wealth of laboratory material. Very extensive and in some cases unique collections of both plants and animals, and a very complete working library, are available to students prepared to use them. Ithaca is located in the Finger Lakes region of Central New York, noted not only for its picturesque beauty, but for its richness in biological material of both plants and animals. In this respect the University is perhaps not excelled by any other institution in the country. The collecting grounds are for the most part adjacent to the campus, and can be very readily visited. Within easy reach of the laboratories are fresh-water marshes and lakes, salt springs, marl springs, marl bogs, peat bogs, extensive ravines with numerous waterfalls, and upland woods or fields over-lying either calcareous or noncalcareous sandy or heavy soils. The country shows a considerable variation in elevation, thus giving samples of several life zones. It is therefore possible to use as illustrative material those inland organisms which may be obtained most readily by teachers throughout the country for use in their classes.

[A limited amount of change in the hours scheduled may be made by the staff at the beginning of the session to avoid conflicts. In the case of morning laboratories the student may obtain permission, at the option of the instructor, to be absent for a period to attend a lecture in some other course. The time so lost is to be made up later.]

COURSES DEALING PRIMARILY WITH PLANTS

S 1a. General Botany—Anatomy and Physiology. Credit three hours. Equivalent to Botany 1, first term. Lectures, M T W Th F, 10. Laboratory and conferences, M T W Th F, 11-1. *Plant Science* 141, 262. Professor PETRY.

The structures and life processes of the higher plants are examined in detail, with considerable attention to information necessary for more advanced or practical work with plants. Students taking this course may attend the field trips offered in connection with Botany S 1b. Laboratory fee, \$3.50.

S 1b. General Botany—Morphology and Taxonomy. Credit three hours. Equivalent to Botany 1, second term. May be taken in conjunction with Botany S 1a, or independently. Lectures, M T W Th F, 2. Laboratory, M T W Th F, 3-4:30. Three half-day field trips on Saturdays to be arranged. *Plant Science* 141, 242. Professor PETRY and Dr. THARP.

Representatives of the principal groups of plants are studied with a view to acquainting the student with the plant kingdom as a whole. The principal families of ferns and flowering plants are examined and practice in identification is given.

The field work is intended to afford to teachers and others first-hand knowledge of the commoner plants of all the great groups. Facilities for collecting plant materials for teaching or other purposes will be provided. Laboratory fee, \$3.50.

S 2. Plant Physiology. Credit four hours. Equivalent to Botany 31. Prerequisite course S 1 or its equivalent, elementary chemistry, and permission to register. Lectures M T W Th F, 12. *Plant Science* 141. Laboratory, T W Th F, 9-12. *Plant Science*, 227. Professor O. F. CURTIS.

This course is designed to acquaint the student with the important life processes of plants. Topics such as water-relations, photosynthesis, translocation, digestion, respiration, mineral nutrition, and growth relations are studied in some detail and particular emphasis is placed both in laboratory and in classroom on discussion of the principles and their applications to growing plants. Laboratory fee, \$4; deposit, \$3.

S 3. Taxonomy of Vascular Plants. Credit four hours. Equivalent to Botany 117. Prerequisite course S 1 or its equivalent. Lectures, M T W Th, 2. Laboratory, M T W Th, 3-6, P, 2-5. Several all-day field trips will be arranged. *Plant Science* 211. Professor WIEGAND.

A study of the kinds of seed plants and ferns; their classification into genera, families, and orders; and field work on the local flora. Emphasis will be placed on wild plants, but the more common cultivated plants will have some attention. The course is planned to follow course S 1 and to furnish an introduction to the knowledge of field botany and to the classification of the higher plants, in preparation for special work in various departments and as an aid in teaching. Instruction will be given in herbarium methods. Laboratory fee, \$4; deposit, \$5.

[**Trees and Shrubs**—A course in the Taxonomy and Ecology of woody plants. Assistant Professor MUENSCHER. Given in the Summer School of Agriculture.]

[**General Plant Pathology**—Given in the Summer School of Agriculture. Open to students in the Summer School of Biology.]

S 4. Comparative Morphology of Fungi. Credit four hours. Equivalent to Plant Pathology 121. Prerequisite course S 1 or its equivalent and permission to register. Lectures, M W F, 9. *Plant Science* 336. Laboratory, fifteen actual hours a week, by arrangement. *Plant Science* 333. Professor FITZPATRICK.

An elementary synoptical course designed to acquaint the student with the general field of mycology. Emphasis is placed on morphology and phylogeny, rather than on taxonomy, but abundant opportunity is given for field work. Laboratory fee, \$6; deposit, \$3.

S 7. Mycology. Credit four hours. Prerequisite courses S 1 and S 4 or their equivalent and permission to register. Lectures or conferences, T Th, by arrangement. Laboratory, fifteen actual hours a week, by arrangement. *Plant Science* 333. Professor FITZPATRICK.

An advanced course designed for students who wish to specialize in mycology or plant pathology. An intensive study of the morphology, taxonomy, cytology, and phylogeny of the fungi. Emphasis is placed on field work, with extensive practice in determination of material.

The groups of the fungi are studied in successive summers in the following order, (1) Phycomycetes, (2) Ascomycetes, (3) Basidiomycetes, (4) Uredinales, Ustilaginales, Fungi Imperfecti, and Myxomycetes. By repeating the course, the student may obtain in four summers the equivalent of Plant Pathology 221 and Plant Pathology 222. He may begin with any one of the four groups and need not take them in unbroken sequence. In the 1934 Summer Session, group (3) Basidiomycetes will be given. Laboratory fee, \$6; deposit, \$3.

S 5. Plant Anatomy. Credit four hours. Prerequisite course S 1 or an equivalent and permission to register. Laboratory, M T Th F, 8-11:30. Hours for lectures to be arranged within these periods. *Plant Science* 228. Professor EAMES and Dr. THARP.

A course in the descriptive anatomy of vascular plants with emphasis on practice in interpretation and determination of material. Laboratory fee, \$5.

[S 8. **Morphology of Vascular Plants.** Not given in 1934.]

S 19. **Special Problems with Plants.** Credit two or more hours. Hours to be arranged. In registering for this course the name of the professor with whom the work is to be taken must be stated.

Students sufficiently prepared may arrange for the study of some problem or special topic. Such work may lie in the fields of general or taxonomic botany, anatomy, comparative morphology, mycology, cytology, plant physiology, paleobotany, plant pathology, or genetics. A member of the staff must supervise the work.

COURSES DEALING PRIMARILY WITH ANIMALS

S 20a. **Introductory Zoology.** Credit three hours. Lectures, M T W Th F, 9. *McGraw* 5. Laboratory, M T W Th, 11-1 or 2-4. Professor REED and Dr. MEKEEL.

The scope, objective, and principles of Animal Biology based upon a study of the structural and physiological organization of an animal type viewed from the standpoint of the organism as a biological unit. Also an introduction to the basic phenomena of reproduction, development, heredity, and evolution. Laboratory fee, \$2.50.

This course is the equivalent of the first term of Animal Biology I given during the academic year.

S 20b. **Intermediate Zoology.** Credit three hours. Lectures, M T W Th F, 10. *McGraw* 5. Laboratory, M T W Th, 11-1 or 2-4. Professor REED and assistant. More advanced than S 20a. A study of the groups of animals stressing the pathway of descent and the critical epochs thereof, kinships, classification, adaptations, behavior, and the zoology of the human species. Laboratory fee, \$2.50. Courses S 20a and S 20b may be taken simultaneously for six hours' credit.

This is the equivalent of the second term of Animal Biology I given during the academic year.

S 21. **Systematic Vertebrate Zoology and Ecology.** Credit four hours. Lectures, M T W Th, 1:40-2:30. Laboratory and field work, M T W Th, 2:30-5:30. *McGraw*. Several all-day trips are required. Occasionally a field trip, 5:30-8 a. m. or 5-8 p. m., may be substituted for the regular periods. Dr. HAMILTON.

Lectures on fishes, amphibians, reptiles, birds, and mammals; their habits, life-histories, coloration, respiration, locomotion, reproduction, and adaptations; together with their classification, nomenclature, characters, and relationships. Laboratory study of the parts employed in the classification of these groups, with training in the identification of two hundred and forty North American species. Field work is partly to give practice in field observations and in ready identification of local vertebrates in their natural environment, and partly to introduce some ecological methods. Textbook: Jordan's *Manual of Vertebrates of the North-eastern United States*, new edition. Laboratory fee, \$4.

S 22 **Invertebrate Zoology.** Credit four hours. Prerequisite Zoology S 20 or an equivalent and permission to register. Daily except Sat., 9-12:30. *McGraw*. Lectures, field trips, laboratory work, and discussions will be arranged during these periods. Assistant Professor YOUNG.

This course should provide a better foundation for the advanced students in the field of zoology or give to the teacher a knowledge of a larger variety of forms available for use in general courses either in high schools or in colleges. It differs from the type of invertebrate course offered by marine biological laboratories in that stress is laid upon many species which may be secured in the living state away from the shore. Methods used in collecting and the study of habitats are the more important objectives of the field trips. Classification, structure, and life cycles are emphasized in the laboratory. Laboratory fee, \$3.

S 23. **Vertebrate Zoology and Comparative Anatomy.** Credit four hours. Lectures, daily except Sat., 8. *McGraw* 5. Laboratory, fifteen hours a week at times to be arranged. Professor REED and Dr. HUNTER.

A thorough dissection and study of the several systems of organs in a selected series of vertebrate types. The various systems are considered with reference to their significance in progressive modifications and their bearing upon vertebrate descent. The lectures deal with the problems of comparative anatomy. Laboratory fee, \$6.

S 26. Histology. The tissues and their histogenesis. Credit four hours. No prerequisite, but previous work in biology, zoology, and botany or physiology is recommended. Lectures, M T W Th F, 12. The laboratory will be open every morning except Saturday. *Stimson*. Professor KINGSBURY and Dr. SNOOK.

For students of biology or those preparing for medicine. The cell and cellular origin of the body; the structure and development of its component tissues. Each student will prepare or receive a series of typical microscopic preparations.

The courses in histology and embryology are given in the histological laboratories in *Stimson Hall*. The department is well equipped for instruction in both subjects, having a large and adequate supply of modern microscopical instruments and an extensive collection of demonstration material for both histology and embryology. Microscopes are furnished by the department. Consultation with the instructors previous to registration is advised. Laboratory fee, \$6.

S 27. Embryology of Vertebrates. Credit four hours. Prerequisite a course in the histology of the tissues or a satisfactory equivalent in other biological work involving training in the use of the microscope. Lectures, M T W Th F, 9. The laboratory will be open every morning except Saturday. Professor KINGSBURY and Dr. SNOOK.

For students of biology or those preparing for medicine. Preparation and study of embryological specimens from all the chief groups of vertebrates. Particular emphasis is placed on the embryology of the chick. The student also acquires a knowledge of special methods useful in embryological work. Laboratory fee, \$6.

S 30. General Entomology. Credit three hours. Equivalent to Animal Biology 3 or Entomology 12. Prerequisite Biology 1 or Zoology 1 or its equivalent. Lectures, M T W Th F, 10. *Entomology Building* 200. Practical exercises, M W F, 1:40-4. *Entomology Building* 200. Professor MATHESON.

This course includes lectures and demonstrations on the characteristics of the orders and families of insects, with the study of their habits, life-histories, and relations to other animals and to plants. The laboratory work consists of the study of the structure, ecology, metamorphosis, and classification of insects. Field trips to study insects in their natural habitats are an important feature. Each student is required to collect and prepare a typical collection of insects. Opportunities are given for the rearing of insects in the Insectary, and special work is offered to suit the needs of individual students. Textbook: Comstock's *Manual for the Study of Insects* (1930 edition). Equipment: a good hand lens, several insect cases, insect pins, and labels. These can all be purchased in Ithaca. Laboratory fee, \$2.50.

S 31. Elementary Morphology of Insects. Credit three hours. Equivalent to Entomology 21. Twenty actual hours a week, by appointment. *Entomology Building* 270. Professor JOHANNSEN.

This course deals with the external and internal anatomy of several representative insects as the locust, roach, cicada, honeybee, crane-fly, etc. Laboratory fee, \$2.

S 32. Elementary Systematic Entomology. Credit two hours. Equivalent to Entomology 15 and 31a. Prerequisite course S 31. Fifteen actual hours a week, by appointment. *Entomology Building* 270. Professor JOHANNSEN.

The principles of wing venation and the classification of the orders and families. Laboratory fee, \$2.

Courses S 31 and S 32 are required of all students who plan to take advanced work in Entomology.

S 34. Advanced Morphology, Histology, and Embryology of Insects. Credit one hour. Prerequisite courses S 31 and S 30 or S 32 or equivalent. M W F, 8.

Lectures, assigned reading, and reports. *Entomology Building 145.* Professor JOHANNSEN.

This course will be given if four or more students register for it. In the summer of 1934 it will deal with embryology of insects.

S 35. Histology of Insects. Credit two hours. Must be preceded or accompanied by course S 31. Laboratory, fifteen actual hours a week, by appointment. *Entomology Building 270.* Professor JOHANNSEN.

Technique in histological methods as applied to insects. Laboratory fee, \$3.

S 39. Special Problems with Animals. Credit two hours or more. Hours to be arranged. In registering for this course the name of the professor with whom the work is to be taken must be stated.

Students sufficiently prepared may arrange for the study of some problem or special topic. Such work may lie in the fields of general zoology, invertebrate zoology, systematic vertebrate zoology, comparative anatomy of vertebrates, ornithology, histology, embryology, general entomology, systematic entomology, economic entomology, or general biology. A member of the staff must supervise the work.

GENERAL COURSES DEALING WITH BOTH PLANTS AND ANIMALS

S 40. Genetics. Credit four hours. Prerequisite elementary botany and plant physiology, or elementary zoology and animal physiology, and permission to register. Courses in cytology and in taxonomic botany or zoology will be found helpful. Lectures, M T W Th F, 8. Laboratory, M W F, 1:40-4. Conferences to be arranged. *Plant Science 146.* Assistant Professor FRASER.

A general introductory course designed to acquaint the student with the fundamental principles of heredity and variation. Special attention is given to the Mendelian interpretation of the facts of inheritance. Among the topics to be discussed are: the physical basis of heredity; determination of sex; factor linkage; measurement of variation; quantitative inheritance; pure lines; inbreeding and cross-breeding; cytoplasmic inheritance; and mutation; with suggestions as to the relation of genetical principles to eugenics. Laboratory studies of variation and of the laws of heredity as illustrated by hybrid material in plants and by breeding experiments with the fruit fly, *Drosophila*. Laboratory fee, \$3.

[S 6. Cytology. Not given in 1934.]

[General Bacteriology. Professor SHERMAN and Assistant Professor STARK. Given in Summer School of Agriculture.]

NEW YORK STATE SUMMER SESSION

AT

CORNELL UNIVERSITY

OFFICERS

LIVINGSTON FARRAND, A.B., M.D., L.H.D., LL.D., President of the University.
ALBERT RUSSELL MANN, B.S.A., A.M., D.Sc., D.Agr., LL.D., Provost of the University.

CARL EDWIN LADD, B.S.A., Ph.D., Dean of the Colleges of Agriculture and Home Economics.

ROLLAND MACLAREN STEWART, A.B., Ph.D., Director and Professor of Rural Education.

CORNELIUS BETTEN, Ph.D., D.Sc., Director of Resident Instruction for the Colleges of Agriculture and Home Economics.

FLORA ROSE, B.S., M.A., D.Ped., Director of the College of Home Economics.

OLIN WHITNEY SMITH, B.S., Secretary of the Colleges of Agriculture and Home Economics.

ESTHER HARRIETTE STOCKS, M.A., Secretary in the College of Home Economics.

STAFF OF INSTRUCTION

(The names of the instructors in the College of Agriculture are printed on page 62; those of the instructors in the College of Home Economics, on page 74; those of the instructors in the Summer School of Biology, on page 53.

COURSES OF INSTRUCTION

Courses of instruction are offered in the New York State Summer Session under the auspices of the New York State College of Agriculture and of the New York State College of Home Economics. These courses are designed primarily to meet the needs of persons engaged in the various forms of educational work concerned with agriculture, home economics, science, and other subjects of study particularly related to the problems of rural life. Teachers, supervisors of instruction, superintendents or principals of schools, extension workers, parents, dietitians, students interested in the study of farm and home practices, vocational counselors, camp directors, and and others responsible for the improvement of rural workers have primary consideration in the program of courses.

ADMISSION

Admission to classes is limited to regularly registered students. No examinations are required for entrance, but the candidate for admission must show that he is qualified to pursue the work offered. He must register for all courses that he expects to attend whether or not he wishes credit. He must register for credit for a minimum of four hours unless he has special permission of his adviser and the approval of the Director. Advice on registration is given through

regular advisers who are members of the Summer Session staff, and who approve the registration cards. See page 61 for the directions about registration.

The graduate student should consult the representative of his major subject if he is matriculating for a regular degree; or the Director of the Graduate School of Education if for the Master's degree in Education; or an adviser selected by the student from the members representing his field of work if he is not a candidate for a degree. See page 5 of the 1933-34 *Announcement of the Graduate School*. Note the University regulation concerning vaccination on page 8 of the same announcement.

TUITION AND FEES

Students resident of New York, who have been residents for at least one year immediately preceding registration, pay twenty dollars, except those registered in the Summer School of Biology, in the Summer Courses in Hotel Administration, in the Graduate School, or in Special Unit Courses. See page 13.

Students who are not residents of New York pay sixty dollars, except those registered for Special Unit Courses, (see page 13), who pay at the rate of ten dollars a week, and graduate students who pay on the Graduate School rate. See page 13.

Graduate students, if they have not previously matriculated in Cornell University, must pay also a matriculation fee of ten dollars. See page 13.

Candidates for advanced degrees who are registered for study under Personal Direction during the intersemester periods are required to pay an administration fee of \$6.25. Such students in the Graduate School as are not exempt from summer course tuition fees may be permitted to take one or more subjects in any of such courses upon the payment of the regular tuition fees. See page 14 for a complete statement.

In certain courses laboratory fees are charged and in others charges are made for materials used. These are indicated in the description of the courses.

A fee of three dollars (\$1.50 for students in special unit courses) is charged for the privileges of Willard Straight Hall. See page 20.

ACADEMIC CREDIT

A student who has previously satisfied the entrance requirements for the college in which he wishes credit may obtain credit for work in the New York State Summer Session up to a limit of eight semester hours. Rarely, however, should students plan to register for more than six semester hours. Students are not permitted to visit classes but may register for courses which they desire to attend without credit, if the instructor is willing. Residence credit is given if

six hours are passed, but not more than a total of two semesters of residence may be obtained by attendance at summer sessions.

DIRECTIONS FOR REGISTRATION

Candidates for degrees should consult the announcements of the respective colleges, since much of the work required for degrees, if offered in the Summer Session at all, is distributed over a period of years. For the requirements for the degree of Bachelor of Science (eight semesters, 122 hours, etc.) see the announcements of the New York State College of Agriculture and the New York State College of Home Economics. For advanced degrees see the Announcement of the Graduate School.

Students should observe the following directions to simplify registration and avoid confusion:

1. Note on page 3 that Monday, July 9, is Registration Day. The student should plan to register on that day.
2. Note the change of place from Roberts Hall to the Drill Hall. Go directly to the Drill Hall to secure registration card and consult officials of the session.
3. Advisers will be present in the Drill Hall to aid in facilitating registration. Feel free to consult with other members of the Staff if you desire. These may be found in their respective offices during registration day.

TEACHERS' CERTIFICATES

The New York State Department of Education through its Teacher Training Division is responsible for the certification of teachers. For information on certificates for work done, see page 11.

The Summer School of Biology and the Graduate School of Education are special groupings and organizations of courses. The courses in Biology are described on pages 53 to 58; those in Education on pages 46 to 52. For other information of a general character, see pages 12 to 21.

SUMMER SCHOOL IN AGRICULTURE

IN THE

NEW YORK STATE COLLEGE OF AGRICULTURE

STAFF OF INSTRUCTION

ARTHUR AUGUSTUS ALLEN, Ph.D.	Ornithology
(Professor of Ornithology)	
ELSA GUERDRUM ALLEN, Ph.D.	Ornithology
(Instructor in Ornithology)	
WALFRED ALBIN ANDERSON, Ph.D.	Rural Social Organization
(Assistant Professor of Rural Social Organization)	
THOMAS LEVINGSTON BAYNE, JR., Ph.D.	Rural Education
(Assistant Professor of Rural Education)	
CORA ELLA BINZEL, M.A.	Rural Education
(Professor of Rural Education)	
JULIAN EDWARD BUTTERWORTH, Ph.D.	Rural Education
(Professor of Rural Education and Director of the Graduate School of Education)	
PETER WALTER CLAASSEN, Ph.D.	Biology
(Professor of Biology)	
RALPH WRIGHT CURTIS, M.S.A.	Floriculture and Ornamental Horticulture
(Professor of Ornamental Horticulture)	
THEODORE HILDRETH EATON, Ph.D.	Rural Education
(Professor of Rural Education)	
FRANK LATTA FAIRBANKS, M.E.	Agricultural Engineering
(Assistant Professor of Agricultural Engineering)	
EMERY NELSON FERRISS, Ph.D.	Rural Education
(Professor of Rural Education)	
FRANK H. FINCH, Ph.D.	Rural Education
(Director of Guidance, University High School, University of Minnesota)	
EARL ALVAH FLANSBURGH, B.S.	Extension Teaching
(County Agent Leader)	
ARTHUR KENDALL GETMAN, D.Sc.	Rural Education
(Chief, Agricultural Education Bureau, New York State Department of Education)	
EVA LUCRETIA GORDON, M.S.	Rural Education
(Assistant in Rural Education)	
EARLE VOLCART HARDENBURG, Ph.D.	Vegetable Crops
(Professor of Vegetable Crops)	
EDWIN RAYMOND HOSKINS, Ph.D.	Rural Education
(Assistant Professor of Rural Education)	
CHESTER JERMAIN HUNN, B.S.A.	Floriculture and Ornamental Horticulture
(Assistant Professor of Ornamental Horticulture)	
MARGARET HUTCHINS, M.A.	Rural Education
(Supervisor of Home Economics Education, New York State Department of Education)	
OSKAR AUGUSTUS JOHANNSEN, Ph.D.	Entomology
(Professor of Entomology)	
MYRON SLADE KENDRICK, Ph.D.	Agricultural Economics and Farm Management
(Assistant Professor of Rural Economy)	
PAUL J. KRUSE, Ph.D.	Rural Education
(Professor of Rural Education)	
CLAUDE L. KULP, M.A.	Rural Education
(Superintendent of Schools, Ithaca, New York)	

- ELLWOOD ALBERT LAFORTUNE, M.A. Rural Education
(Director of Guidance in the Secondary Schools, Vice-Principal of the Senior
High School, Ithaca, N. Y.)
- ROBERT MATHESON, Ph.D. Entomology
(Professor of Economic Entomology)
- LUA ALICE MINNS, M.S.A. Floriculture and Ornamental Horticulture
(Assistant Professor of Floriculture)
- CLYDE B. MOORE, Ph.D. Rural Education
(Professor of Rural Education)
- RICHARD ALAN MORDOFF, Ph.D. Meteorology
(Professor of Meteorology)
- C. CAYCE MORRISON, Ph.D. Rural Education
(Assistant Commissioner of Elementary Education, New York State Department
of Education)
- WALTER CONRAD MUENSCHER, Ph.D. Botany
(Assistant Professor of Economic Botany)
- E. LAURENCE PALMER, Ph.D. Rural Education
(Professor of Rural Education)
- GEORGE ERIC PEABODY, M.S. Extension Teaching
(Assistant Professor of Extension Teaching)
- W. HOWARD PILLSBURY, A.B. Rural Education
(Superintendent of Schools, Schenectady, New York)
- ROBERT ARNOLD POLSON, Ph.D. Rural Social Organization
(Assistant Professor of Rural Social Organization)
- JOSEPH PULLMAN PORTER, M.S.A., M.L.D.
Floriculture and Ornamental Horticulture
(Acting Professor of Ornamental Horticulture)
- MYERS PETER RASMUSSEN, Ph.D. Agricultural Economics and Farm Management
(Professor of Marketing)
- LOUIS MICHAEL ROEHL, B.S. Agricultural Engineering
(Professor of Agricultural Engineering, in Charge of Farm Shop)
- DWIGHT SANDERSON, Ph.D. Rural Social Organization
(Professor of Rural Social Organization and Head of the Department of Rural
Social Organization)
- GAD PARKER SCOVILLE, M.A. Agricultural Economics and Farm Management
(Professor of Farm Management)
- JAMES MORGAN SHERMAN, Ph.D. Dairy Industry
(Professor of Dairy Industry and Head of the Department of Dairy Industry)
- LLOYD R. SIMONS, B.S.A. Extension Teaching
(Professor of Extension Teaching and Director of Extension)
- CLIFFORD NICKS STARK, Ph.D. Dairy Industry
(Assistant Professor of Bacteriology)
- ROLLAND MACLAREN STEWART, Ph.D. Rural Education
(Professor of Rural Education and Director of the New York State Summer
Session)
- MARION S. VAN LIEW, B.S. Rural Education
(Chief, Home Economics Education, New York State Department of Education)
- EDMOND E. VIAL, Ph.D. Agricultural Economics and Farm Management
(Agricultural Economist, U. S. Bureau of Agricultural Economics)
- DONALD STUART WELCH, Ph.D. Plant Pathology
(Assistant Professor of Plant Pathology)
- ANDREW LEON WINSOR, Ph.D. Rural Education
(Assistant Professor of Rural Education)
- LAWRENCE CLARK WOODRUFF, M.A. Biology
(Assistant in Biology)
- PAUL WORK, Ph.D. Vegetable Crops
(Professor of Vegetable Crops)
- FORREST BLYTHE WRIGHT, Ph.D. Agricultural Engineering
(Instructor in Agricultural Engineering)

AGRICULTURAL ECONOMICS AND FARM MANAGEMENT

S 102. Farm Management. Credit three hours. Lectures, daily except S, 8. Laboratory, S, 8-10:30; some all day trips on Sat. Probably one two-day trip will be arranged. *Agricultural Economics* 101. Professor SCOVILLE.

It is desirable that this course be preceded by courses dealing with the production of crops and animals or that the student have considerable farm experience in crop and animal production.

Lectures, recitations, laboratory practice, and field trips. Farming as a business; types of farming; size of business; balance of business; rates of production; farm layout; building arrangement; machinery; buying and selling; ways of starting to farm; forms of tenure and leases; choosing and buying a farm; use of capital and credit; planning, organization, and management of specific farms.

S 111. Agricultural Statistics. Credit two hours. Lectures, daily except M and S, 12. Laboratory, M, 1:40-4. *Agricultural Economics* 125. Dr. VIAL. Fee for materials, \$3.

S 115. Prices. Credit two hours. Lectures, daily except Th and S, 9. Laboratory, Th, 1:40-4. *Agricultural Economics* 125. Dr. VIAL.

Factors affecting prices of farm products. Fee for materials, \$3.

S 142. Marketing Fruits and Vegetables. Credit three hours. Lectures, daily except S, 11. *Agricultural Economics* 225. Laboratory, T, 1:40-4. A discussion period to be arranged. *Agricultural Economics* 240. Professor RASMUSSEN.

A study of the economic factors involved in the marketing of fruits and vegetables. Regional and seasonal competition; areas of distribution; methods of handling; costs of marketing; types of marketing organizations; sales methods; transportation and carrier services; produce law and methods of credit rating; terminal problems. Fee for materials, \$3.

S 250. Taxation. Credit two hours. Daily except S, 10. *Agricultural Economics* 225. Assistant Professor KENDRICK.

The emphasis of the course is on state and local problems connected with rural taxation. Among the subjects considered are: the growth of expenditures; the rise of modern tax problems; how various governmental divisions in New York and other states get their tax revenues; the general property tax and its administration, and the special cases of personal-property, farm, and forest taxation; income, inheritance, and gasoline taxes; problem of proper distribution of the tax burden among the various state and local governmental units. Fee for materials, \$1.

S 252. Economics and the School. Credit two hours. Class discussion, M W F, 2:30-4:00. *Agricultural Economics* 225. Assistant Professor KENDRICK. A consideration of certain economic problems selected because of their interest to the school principal.

AGRICULTURAL ENGINEERING

S 40c. Advanced General Farm Shop. Credit three hours for three special units of two weeks each. Units may be taken separately for one hour of credit each. Daily except S, 10-12. *Agricultural Engineering Laboratory*. Professor ROEHL and Dr. WRIGHT.

These courses are designed primarily for teachers of agriculture who are giving the work as part of the shop courses in high schools or who are conducting extension work. The preparation of job sheets will be a part of the instruction.

Unit 1. July 9 to 20. **Plumbing and its Application to the Home and the Farm.** Dr. WRIGHT.

A study of plumbing systems, plumbing materials, including fixtures, pipe, fittings, etc.; practice to give skill in plumbing operations; a study of the various types of domestic water systems. Laboratory fee, \$1.

Unit 2. July 23 to August 3. **Automobiles and their Engines.** DR. WRIGHT.

A study of (1) the principles of operation, care, and repair of automobile engines; (2) the general structure and principles of operation of the various automobile units, including modern features; (3) the servicing of cars such as lubrication, battery care, tires, etc. Laboratory fee, \$1.

Unit 3. August 6 to 17. Shop Organization and Management. Professor ROEHL.

A course dealing primarily with the plans of shops, designs of home-made equipment such as workbenches, tool and storage cabinets, lumber and iron racks, etc.; shop tools and supplies; shop management; the demonstration and job sheet methods of teaching. Students will be permitted to work on individual problems by arrangement.

S 41. General Shop Work for Rural High-School Teachers. Credit two or four hours. Daily, 9-11, and M W F, 1:40-4:45 for four hours' credit. *Agricultural Engineering Laboratory.* Professor ROEHL and Dr. WRIGHT.

Practical jobs to develop skill in woodwork, saw filing, tool grinding, handle fitting, harness repairing, rope work, cold metal working, farm blacksmithing, painting and glazing, furniture repairing, and refinishing as suited to the needs of rural communities.

A course for teachers of agriculture and for teachers of industrial arts in rural high schools designed to develop skill in performance. Should be accompanied or preceded by Rural Education S 142a. Laboratory fee, \$3.

S 42. Industrial Arts Drawing and Design. Credit one hour. Daily except S, between 11 and 12 for six weeks, or daily, 11-1 and S, 8-1, if carried for two weeks. *Agricultural Engineering Laboratory.* Professor ROEHL.

Planned to qualify for teaching mechanical and freehand drawing and design as part of the Industrial Arts work in seventh, eighth, and ninth grades.

S 101a. Electricity and its Application to the Home and Farm. Credit two hours for two special units of two weeks each. Units may be taken separately for one hour of credit each provided the first unit precedes the second. M W F, 1:40-4:45, and one extra hour each week.

Unit 1. July 9 to 20. A study of elementary electricity, dry cell and storage batteries, elementary wiring, lighting and power circuits, switching circuits, burglar alarms, wiring materials, wiring code rules. Laboratory fee, \$1.

Unit 2. July 23 to August 3. A study of house wiring, including the actual wiring of a small building, heating appliances, motor appliances, illumination and illuminating equipment including portable lamps, and power distribution systems. Laboratory fee, \$2.

S 102a. Farm Power and Field Machinery. Credit two or four hours. Two units may be taken separately for two weeks each.

Unit 1. July 23 to August 3. Must precede unit 2, August 6 to 17. (Unit 2 will not be given unless five persons are registered.) Daily except S, 8-11, and five or ten additional hours by appointment. *Agricultural Engineering Laboratory.* Assistant Professor FAIRBANKS.

Designed for teachers of agriculture in service. A study of types of farm tractors, the tractor itself, overhauling and repair of tractors and field machines, tractor operations, farm jobs for class instruction, farm and school tool equipment. Special emphasis upon practice appropriate to the shop program and departments of agriculture.

S 240. Research Studies in Farm Shop. Credit to be arranged. Hours to be arranged. T Th, 1:40-4, S, 8-1. *Agricultural Engineering Laboratory.* Professor ROEHL.

A course designed for teachers of agriculture and of general shop practices, village principals, and others who have responsibilities for teaching or supervising shop work. Each student must develop a special research problem, perform and describe the special shop work which the problem entails, and set up a plan for its inclusion in the shop for home or school purposes. Must be preceded or accompanied by Rural Education S 142a.

BACTERIOLOGY

S 1. General Bacteriology. Credit two or four hours. Lectures, daily except S, 1:40. Laboratory, daily except S, 2:30-4:30. *Dairy 119*. Professor SHERMAN and Assistant Professor STARK.

An introductory course giving a general survey of the field of bacteriology, together with the fundamentals essential to further work in the subject. The morphology, physiology, and classification of bacteria; the culture of micro-organisms, simple and differential staining, and general bacteriological technique; the bacteriology of soil, air, water, sewage, milk, and foods; the principles of immunity and the microbiology of disease.

Laboratory fee, \$10, for those seeking four credit hours.

BIOLOGY

S 1. General Biology. Credit three hours. Lectures, daily except S, 9. *Roberts 392*. Laboratory and field work, M W F, 1:40-4; other sections by special arrangement. *Roberts 302*. Professor CLAASSEN and Mr. WOODRUFF.

Designed to acquaint the general student and the prospective teacher with the main ideas of biology through selected practical studies of the phenomena on which biological principles are based. Lectures, laboratory work, and field trips include studies of such simpler organisms as protozoa, algae, fungi, and bacteria, followed by studies of the more highly specialized forms of plant and animal life. Laboratory fee, \$3.50.

S 2. Laboratory and Field Biology. Credit two hours. Laboratory and field work, T Th, 1:40-5 and an additional period to be arranged. *Roberts 302*. Professor CLAASSEN and Mr. WOODRUFF.

The laboratory and field problems of the teacher of high school or college biology. Particular emphasis is placed upon the collection and preparation of laboratory material for class use. Laboratory fee, \$2.

SUMMER SCHOOL OF BIOLOGY

Under the auspices of the New York State College of Agriculture and the Summer Session of Cornell University, there has been brought together a group of courses dealing with the biological sciences. These courses furnish an excellent opportunity for students of the biological sciences to have access to a series of studies from year to year in one of the most appropriate locations in the country. For full information see page 53.

BOTANY

S 13. Trees and Shrubs. Credit two hours. Lectures and laboratory, M W, 1:40-5:30, or T Th, 1:40-5:30. Sections limited to twenty students. Additional trips to be arranged. *Plant Science 353*. Assistant Professor MUENSCHER.

Intended for those who wish to know the woody plants in the field. The aim is to familiarize the student with as many as possible of the trees and shrubs of the Cayuga Lake flora and to teach the main facts of structure, growth, habit, and distribution concerning them. Some all day trips will be required. Laboratory fee, \$1.50; deposit, \$3.

Other courses dealing with plants are offered in the Summer School of Biology. See page 54.

ENTOMOLOGY

S 30. General Entomology. Credit three hours. Equivalent to Animal Biology 3 or Entomology 12. Prerequisite Biology 1 or Zoology 1 or its equivalent. Lectures, daily except S, 10. Practical exercises, M W F, 1:40-4. *Entomology Hall 200*. Professor MATHESON.

Lectures and demonstrations on the characteristics of the orders and families of insects, with a study of their habits, life-histories, and relations to other animals and to plants. The laboratory work consists of the study of the structure, ecology, metamorphosis, and classification of insects. Field trips to study insects in their natural habitats are an important feature. Each student is required to collect and prepare a typical collection of insects. Opportunities are given for the rearing of insects in the Insectary, and special work is offered to suit the needs of individual students. Textbook: Comstock's *Manual for the Study of Insects* (1930 edition). Equipment: a good hand lens, several insect cases, insect pins, and labels. These can all be purchased in Ithaca. Laboratory fee, \$2.50.

S 31. Elementary Morphology of Insects. Credit three hours. Twenty actual hours a week, by appointment. *Entomology Hall 270*. Professor JOHANNSEN.

The external and internal anatomy of several representative insects as the locust, roach, cicada, honeybee, crane fly, etc. Laboratory fee, \$2.

EXTENSION TEACHING

S 100. Oral Expression. Credit two hours. Lectures and practice, daily except S, 10. *Roberts 131*. Criticism by appointment, daily, 8-1. Registration limited to twenty students. Open only to upperclassmen and regular summer school students. Assistant Professor PEABODY.

This is a course in practical public speaking, designed to give experience by practice in speaking on public questions. Special attention is paid to training in the use of illustrated material. In addition to the work in public speaking a study is made of parliamentary practice. This course should be of special benefit to teachers and extension workers.

S 100a. Oral Expression. Credit one hour. Lectures and practice, M W F, 12. *Roberts 292*. Open to vocational teachers of agriculture and extension workers. Assistant Professor PEABODY.

Designed to assist educational leaders in agriculture relative to public speaking and parliamentary practice.

S 105. Extension Organization, Administration, Policy, and County Program Building for Agriculture. Credit four hours. Open to upperclassmen and graduate students. Lectures and practice periods, daily except S, 11, 1:40-3. *Roberts 301*. Professor SIMONS and Mr. FLANSBURGH in charge.

Designed to familiarize students with the organization, administration, and policies of the Extension Service, with emphasis upon county program building in agricultural subjects such as animal husbandry, poultry, agronomy, and vegetable crops (including potatoes). The course is designed for county agents, specialists, and administrators in the field of agricultural extension as well as for prospective extension workers.*

FLORICULTURE AND ORNAMENTAL HORTICULTURE

S 1. Woody Plant Propagation and Nursery Work. Credit one hour. Lectures, T Th, 9. Laboratory, M, 10-12:40, 1:40-4. Laboratory fee, \$3. *Plant Science 40 and Nursery*. Assistant Professor HUNN.

The methods of propagation of all classes of ornamental woody plants and their special treatment during the first stages of growth. The course also acquaints the student with the principles governing the transplanting of trees, shrubs, and herbaceous perennials, and with the methods practiced in all types of commercial nursery management. Should be accompanied by S 3 and S 4. All members of the class must participate in an excursion to some New York State nursery on August 3.

S 3. Landscape Planting. Credit two hours. Lectures and laboratories, T, 10-1, T, 1:40-4:30, W, 11-1. Should be accompanied by S 6 and must be ac-

*A special folder will be issued later giving detailed information regarding instruction and instructors.

accompanied by S 4. All members of the class must participate in the department excursion to Rochester on August 10 and 11. *Plant Science* 433. Acting Professor PORTER.

A brief course intended to familiarize the student with the best trees, shrubs, and vines, with special emphasis upon their use. Names, characteristics, and requirements will be studied in the field and in the laboratory. The lectures will deal with planting practices and the selection and arrangement of plants. Laboratory fee, \$3. Registration limited to 16. Consult department office when registering.

S 4. Landscape Planning. Credit two hours. Lectures and laboratories, W, 8-11, Th, 10-1, Th, 1:40-4:30. Should be accompanied by S 6 and either S 3 or S 8 is required. All members of the class must participate in the department excursion to Rochester on August 10 and 11. *Plant Science* 433. Acting Professor PORTER.

A discussion of the fundamental principles of landscape planning as related to home grounds, school grounds, and other landscape improvement work. A brief course, not professional, intended for students who desire an intelligent point of view but who do not intend to take technical courses. Laboratory fee, \$3. Registration limited to 16. Consult department office when registering.

S 5. Indoor Flower Growing. Credit one hour. Lectures, T Th, 11. *Plant Science* 37. Laboratory, T, 1:40-4:30. *Plant Science* 15. Assistant Professor MINNS.

The propagation and culture of plants suitable for winter gardens in homes and schoolrooms, including a study of containers, soils, fertilizers, insecticides. The selection of varieties of bulbs and methods of culture indoors are considered, as are also the method of propagation and general care of species of plants suited for indoor culture. Laboratory fee, \$1.

S 6. Garden Flowers. Credit two hours. Lectures, M T Th, 9, F, 11. *Plant Science* 37. Laboratory, W F, 1:40-4:30. *Plant Science* 15, *Greenhouses*, and *Gardens*. Assistant Professor MINNS. Laboratory fee, \$2.

A study of herbaceous plant materials. The aim is to give the student such an intimate knowledge of these forms of plants as may be used in garden planting, either in home grounds, rural social centers, or public parks, more particularly with reference to summer conditions. Students must have had sufficient botany to be familiar with the botanical characters and classification. An excellent collection of plant material is available for demonstrations. All members of the class must participate in an excursion to visit private estates and public parks in Canandaigua and in Rochester on August 10 and 11.

S 8. Woody Plant Materials for Landscape Planting. Credit four hours. Lectures, M T Th F, 8. Laboratory and field trip, M T, 10-12:30, W Th, 11-1, M T, 1:40-4:30. *Plant Science* 29 and *Campus*. Professor R. W. CURTIS.

Intended for graduate students and advanced students in floriculture and ornamental horticulture. Laboratory fee, \$3.

A study of the characteristics and requirements of trees, shrubs, and vines for landscape planting. The laboratories and field trips enable the student to recognize common woody plants. The lectures discuss planting areas, planting practices, and plant materials, in order that the student may learn to see plants not only as growing things but as possible units in designs with which he may be able to improve his surroundings. All members of the class must participate in an excursion on August 10 and 11 to visit private estates and public parks in Canandaigua and in Rochester. The transportation charge will be \$5.

S 9. Summer Propagation. Credit two hours. Lectures, T Th, 10. Laboratories, W, 1:40-4, F, 10-12, 1:40-4. *Greenhouses* and *Nurseries*. Assistant Professor HUNN.

Intended for students who have had the beginning course in propagation. See S 1. Laboratory fee, \$3.

Advantage is taken of the summer months to amplify the regular and summer courses in propagation by intensive practice in the summer production of soft wood cuttings and the budding of nursery stocks. This will include the manage-

ment of hot beds and the lining-out system followed in the production of stock plants. Two extra hours a week before and after classes are required for care of hot beds. Two one-day trips are planned for visits to producing nurseries on July 13 and August 3.

METEOROLOGY

S 1. Meteorology and Climatology. Credit two hours. Lectures and discussions, daily except S, 10. *East Roberts* 222. Professor MORDOFF.

This course is adapted to the needs of teachers and students in subjects of which weather and climate are important factors, particularly teachers of physical geography and general agriculture. It is designed to acquaint the student with the laws governing the primary and secondary circulation of the atmosphere and with the development, progression, and conditions that attend cyclones, tornadoes, and other atmospheric phenomena. Attention is given to the principles and practice of weather forecasting from weather maps and from local observations.

S 2. Meteorology and Climatology—Laboratory Course. Credit one hour. W F, 1:40-4, or other periods to be arranged. Must be accompanied by Course S 1. *East Roberts* 341. Professor MORDOFF.

The work consists in the study of the principal weather and climatic elements with the aid of maps, charts, and instruments. The various meteorological instruments will be studied, as well as the methods of taking and recording the observations.

NATURE STUDY

Cornell University is admirably located for the study of nature in the field. Fish hatcheries, state and municipal parks, museums, and game farms are convenient to the campus and to those who wish to study the methods there followed in addition to becoming acquainted with the wild life in its natural setting. For description of the courses offered in Nature Study see *Rural Education*, page 49.

ORNITHOLOGY

S 11. Ornithology. Credit three hours. Lectures, M W, 11. *McGraw* 5. Laboratory, M W, 1:40-4:30, or T Th, 1:40-4:30. Field work, M W, or T Th, 5:30-8 a.m. Professor ALLEN and Dr. ALLEN.

This course gives an introduction to the study of birds and familiarity with the local species. The lectures cover such subjects as classification, migration, coloration, song, nest-building, eggs, care of young, methods of attracting birds, and their economic importance. The laboratory work with bird skins gives an intimate knowledge of the birds of Eastern North America and familiarity with the use of a manual. The aim of the field work is the identification of birds by their songs and habits as well as by their plumage. Each student should be provided with field or opera glasses. Laboratory fee, \$3.

PLANT PATHOLOGY

S 1a. Diseases of Plants and their Control. Credit one to four hours. Pre-requisite permission to register. Lectures, three times a week and other times by arrangement. *Plant Science* 336. Laboratory, the completion of a minimum of five exercises for each credit hour, with personal conferences. Conferences by arrangement. Laboratory at the student's convenience. Assistant Professor WELCH.

A fundamental course treating of the nature, cause, and control of plant diseases, illustrated by studies of the more common diseases of cultivated crops. The method of conducting the course enables the individual student to study diseases which are of particular interest to him. The work is designed to meet the special needs of teachers of agriculture in secondary schools, teachers of biology, and county agents, as well as undergraduates in the College of Agriculture. Laboratory fee, \$1.25 a credit hour; breakage deposit, \$3.

RURAL EDUCATION

All courses in Rural Education, listed here for the convenience of students, are described under the Graduate School of Education, pages 48 to 52.

EDUCATIONAL PSYCHOLOGY AND MEASUREMENT		Page
S 111a	Psychology for Students of Education. Assistant Professor Bayne.	48
S 116	Child Psychology. Professor Kruse.	49
S 150	Introduction to Educational Measurement. Assistant Professor Bayne.	49
S 212	Psychology of Learning. Professor Kruse.	49
S 215	Psychology of Adolescence. Assistant Professor Winsor.	49
EDUCATIONAL METHOD		
S 107a	The Teaching of Nature Study and Elementary Science. Professor Palmer and Miss Gordon.	49
S 132k	The Organization and Teaching of Adult and Part-time Groups. Assistant Professor Hoskins.	49
S 132l	The Training of Teachers for Pupil Placement in Farming Situations. Assistant Professor Hoskins.	49
S 133	The Teaching of Agriculture in the Secondary School. Assistant Professor Hoskins.	50
S 142a	Organization and Methods of Teaching Industrial Arts. Mr. Kulp.	50
S 173	Methods of Teaching Adult Classes in Home Economics. Miss Van Liew and Miss Hutchins.	50
S 226	The Teaching of Science in the Rural Secondary School. Professor Palmer.	50
S 232	The Teaching of Agriculture in the Secondary School. Assistant Professor Hoskins.	50
S 235	Creative Procedures in Teaching Home Economics in the Public Schools. Professor Binzel.	50
S 249	Seminary in Home Economics Education. Professor Binzel.	50
S 250	Seminary in Agricultural Education. Professor Stewart.	50
EDUCATIONAL ADMINISTRATION AND SUPERVISION		
S 169a	Administrative Problems of the Home Making Teacher. Miss Van Liew and Miss Hutchins.	51
S 261	The Administration of Rural Schools. Professor Butterworth.	51
S 262b	The School Plant. Professor Butterworth.	51
S 266	The Supervision of Elementary School Subjects. Professor Moore	51
S 267a	The Administration of Vocational Agriculture. Professor Stewart	51
S 272a	New Problems in the Supervision of Rural Schools. Dr. Morrison	51
S 276	Principles of Curriculum Building. Professor Ferriss.	51
HISTORY AND PRINCIPLES OF EDUCATION		
S 2	Principles of Secondary Education. Mr. Pillsbury.	52
S 6	Philosophy of Education. Professor Eaton.	52
S 194	Education and Vocations. Professor Eaton.	52
S 281	The High School in Rural and Village Communities. Professor Ferriss.	52
EDUCATIONAL AND VOCATIONAL GUIDANCE		
S 28	Educational and Vocational Guidance. Dr. FINCH.	52
S 29	Analysis of the Individual and Counseling. Dr. FINCH.	52
S 132j	Special Problems in Guidance in Relation to Agriculture. Dr. Getman.	49
S 132m	The Guidance of Secondary Pupils. Mr. LaFortune.	49
S 217	Psychological Tests in Guidance. Assistant Professor Winsor.	49
RESEARCH		
S 300	Research.	52

RURAL SOCIAL ORGANIZATION

S 1. General Sociology. Credit two hours. Lectures and discussions. Daily except S, 8. *Agricultural Economics* 325. Assistant Professor ANDERSON.

A study of the structure and functioning of society, its group organization and activities. Social processes, social forces, and social controls will be exemplified for both urban and rural life. Fee for materials, \$1.

S 12. The Sociology of Rural Life. Credit two hours. Daily except S, 10. *Agricultural Economics* 310. Assistant Professor POLSON.

An examination of the sociological structure of rural life, as a basis for the analysis of rural problems. Some phases of rural life considered are: health, education, religion, standards of life, the family, government, social life, and recreation.

S 111. Rural Community Organization. Credit two hours. Daily except S, 8. *Agricultural Economics* 310. Assistant Professor POLSON.

A consideration of the aims and methods of the organization of rural communities. Typical communities are studied, their problems are analyzed, and methods of organization are discussed. The county as a unit of social organization also is considered in its relation to community organization.

S 121. The Family. Credit two hours. Daily except S, 10. *Agricultural Economics* 340. Professor SANDERSON. Prerequisite course S 1 or its equivalent.

This course deals with the social problems of the family both on the farm and in the city; the history of the family; the differences in family life in the country and in the city; the function of the family in society; relations of parents and children; marriage and divorce; and factors affecting family relations. Fee for materials, \$2.

S 122. Social Problems and Public Welfare Organization. Credit two hours. Prerequisite course S 1 or its equivalent. Daily except S, 11. *Agricultural Economics* 340. Assistant Professor ANDERSON.

A study of the social problems of poverty, crime, delinquency, the physically and mentally handicapped, social insurance, mothers' pensions; private and public social agencies; public policy regarding their organization and support. Special attention will be given to the social legislation of New York State.

VEGETABLE CROPS

Three unit courses have been shaped to serve the needs of extension workers and teachers. They will deal with underlying principles, newer developments in research, relation to current practice and methods of orderly presentation to grower and school groups. Opportunity is also provided to graduate students for informal study or problem work under personal supervision. Such study may count toward a degree if proper arrangements are made with the department.

S 2a. Potato Production. Credit one hour. Lectures, daily except S, 9. Laboratory, T Th, 1:40-4:30. July 9 to 20. *East Roberts* 223. Professor HARDENBURG.

The potato crop: culture, varieties, harvesting, storage, and marketing.

S 12a. Grading and Handling Vegetable Crops. Credit one hour. Lectures, daily except S, 9, and a field trip. July 23 to August 4. *East Roberts* 223. Professor WORK.

Quality in vegetables; influence of environment, culture, handling, and storage upon quality and salability; harvesting, grading, packing, inspection, transportation, refrigeration, and storage of vegetables. A two-day field trip to visit up-state markets and production centers is required: 11 a.m. August 3 to evening of August 4. Approximate cost, \$7.

S 101a. Recent Trends in Vegetable Crops. Credit one hour. Lectures, daily except S, 9. Laboratory, W F, 1:40-4:30. *East Roberts* 223. August 6-17. Professor WORK.

Results of recent research as affecting practice. Plant growing, premature seeding, cultivation, nutrition, and other problems.

HOME AND COMMUNITY GARDENS

Gardening for home food supply has never, except in war time, been of so great interest to so many persons as now. It provides food of high nutritional value at low cost and without the expense of distribution which adds from a third to nine-tenths to the price of vegetables bought in the market. This interest is felt wherever incomes have been reduced, on farms, in villages, and in cities. Aside from its contribution to subsistence, its values for recreation and for education are now recognized. It has an important place in community movements and in settlement plans.

S 103. Vegetable Gardens for Home, Farm, and School. Credit two hours. Lectures, M W F, 11. *East Roberts* 223. Laboratory, T Th, 1:40-4. Places to be announced. Professor **WORK**.

A course for teachers and others interested in the usefulness and practice of gardening in home, school, and community. The value of vegetable food in the dietary. Location, planning, soil management, seeds and plants, planting, cultivation, diseases, insects, storage. The crop plants, their characteristics and relations to environment, cultural practices. The laboratory work includes practice in planting and caring for gardens as well as studies of plant materials. Laboratory fee, \$1.50.

RESEARCH

S 221. Special Problems in Vegetable Crops. Credit two or more hours. Hours to be arranged. Open to graduate students and advanced undergraduates with adequate preparation. Professors **WORK**, **HARDENBURG**, and **KNOTT**.

A study of some specific phase of the growth of vegetable crops, or of the handling of vegetable products. This may involve a critical review of the literature of some special subject, or the investigation of some special phase of the research projects under way in the greenhouse or gardens. Students may, by special arrangement, continue the work throughout the summer.

SPECIAL UNIT COURSES IN THE SUMMER SCHOOL OF AGRICULTURE

Teachers of agriculture, county agents and other extension leaders, district superintendents, high school principals and other educational leaders often find it difficult to be away from their duties for six weeks. The special unit courses have been established to meet the convenience of such workers. See the respective departments for the schedule and description of courses.

FIRST PERIOD, July 9 to 20

	Page
<i>Agricultural Engineering</i>	
S 40c. Unit 1. Plumbing and its Application to the Home and the Farm	64
S 42. Industrial Arts Drawing and Design	65
S 101a. Unit 1. Electricity and Its Application to the Home and the Farm	65
<i>Rural Education</i>	
S 132j. Special Problems in Guidance in Relation to Agriculture....	49
S 132m. Guidance of Secondary Pupils	49
<i>Vegetable Crops</i>	
S 2. Potato Production	71

SECOND PERIOD, July 23 to August 3

<i>Agricultural Engineering</i>	
S 40c. Unit 2. Automobiles and their Engines	64
S 42. Industrial Arts Drawing and Design	65
S 101a. Unit 2. Electricity and its Application to the Home and the Farm, Advanced Unit	65
S 102a. Farm Power and Field Machinery	65
<i>Rural Education</i>	
S 132k. The Organization and Teaching of Adult and Part-time Groups	49
<i>Vegetable Crops</i>	
S 12a. Grading and Handling Vegetable Crops	71

THIRD PERIOD, August 6 to 17

<i>Agricultural Engineering</i>	
S 40c. Unit 3. Shop Organization and Management	65
S 42. Industrial Arts Drawing and Design	65
S 102a. Farm Power and Field Machinery, Advanced Unit	65
<i>Rural Education</i>	
S 132l. The Training of Teachers for Pupil Placement in Farming Situations	49
S 272a. New Problems in the Supervision of Rural Schools	51
<i>Vegetable Crops</i>	
S 101a. Recent Trends in Vegetable Crops	71

SUMMER SCHOOL OF HOME ECONOMICS

IN THE

NEW YORK STATE COLLEGE OF HOME ECONOMICS

STAFF OF INSTRUCTION

BEULAH BLACKMORE, B.S.	Textiles and Clothing
(Professor of Home Economics)	
OLGA P. BRUCHER, M.A.	Foods and Nutrition
(Assistant Professor of Home Economics)	
HELEN CANON, Ph.D.	Economics of the Household and Household Management
(Professor of Home Economics)	
ELLA CUSHMAN, M.S.	Economics of the Household and Household Management
(Extension Instructor in Home Economics)	
MARION FISH, Ph.D.	Economics of the Household and Household Management
(Assistant Professor of Home Economics)	
MARIE BELLE FOWLER, M.A.	Family Life
(Professor of Home Economics)	
HAZEL M. HAUCK, Ph.D.	Foods and Nutrition
(Assistant Professor of Home Economics)	
GRACE HENDERSON, M.S.	Home Economics
(Assistant in Home Economics)	
MARGARET HUMPHREY, M.A.	Textiles and Clothing
(Instructor in Home Economics)	
HELEN MONSCH, M.A.	Foods and Nutrition
(Professor of Home Economics)	
MARIE REED, R.N.	Family Life
(Assistant in Home Economics)	
KATHERINE M. REEVES, B.A.	Family Life
(Instructor in Home Economics)	
RUTH JEAN SCOTT, B.S.	Textiles and Clothing
(Assistant Professor of Home Economics)	
ETHEL B. WARING, Ph.D.	Family Life
(Professor of Home Economics)	
MARGARET WYLIE, Ph.D.	Family Life
(Extension Professor of Home Economics)	
FLORENCE E. WRIGHT, M.S.	Household Art
(Extension Assistant Professor of Home Economics)	

Courses in the summer school of 1934 are devised primarily to meet the needs of teachers and extension workers who wish to broaden and strengthen their background of home economics and to reorganize their teaching programs in order to meet more adequately the needs of the situations in which they work.

Many of these students may be working toward the degree of Master of Science in Education, which permits them to select a limited number of courses from the various fields of home economics according to their individual needs and interests.

Other students, not planning to work for an advanced degree, may prefer to be free to choose courses without regard to the requirements of the Graduate School. If students in this group desire to specialize later, the work done in some specific field may be applied toward an advanced degree in that field.

A third group consists of those who wish to specialize intensively in some one or two related fields of home economics, thus working toward an advanced degree. The fields in which graduate work of this type is offered are: family life, foods and nutrition, textiles and clothing, household art, and economics of the household and household management.

The equivalent of one year's residence or at least four summer sessions is the minimum requirement for a Master's degree. Before registering for an advanced

degree a student should seek an adviser in the field of her major interest to help her plan a program of graduate study.

The attention of teachers is especially called to course S 285 described below; of extension workers, to the group of extension courses described on page 78.

AN INTEGRATED COURSE FOR HOME ECONOMICS TEACHERS

Many teachers have realized that their teaching can function best when courses are so organized as to show the essential relationships in life situations of the different fields of home economics subject matter. This course results from the expression by teachers of a need for help in integrating their courses effectively.

S 285. Problems in Family Living. Credit four hours. Prerequisite home economics teaching experience. Daily except S, 8-10. *Martha Van Rensselaer Hall 121.* Professors WARING and CANON, Assistant Professors BRUCHER and FISH, and Miss CUSHMAN.

This is a cooperative course to which all departments in the college are contributing, directly or indirectly as needed, to give teachers experience in selecting, organizing, and developing home economics subject matter around everyday situations and problems. Most problems arising in the home are many-sided and can be solved only by understanding the relation of the factors concerned. This close connection has been largely obscured through the departmentalizing of subject matter. It is hoped through this course to help teachers to see more clearly the integration and relation of the different aspects of home economics teaching. Daily group discussions will be participated in by the class and the staff. Smaller groups of students will work with individual staff members according to the particular situations they are considering. Individual conferences will be arranged as needed. Fee, \$3.

FAMILY LIFE

Human behavior is today a critical factor in the world situation. With materials in abundance and with skills and techniques advanced beyond present ability to use them constructively, social behavior is today one of the factors that prevents progress. For the most part, people cannot be depended upon to think, feel, and act for the good of the group unless they can see immediate individual advantage. Individuals, however, can learn to respond to larger social values. The simple and almost universal laboratory for developing social interaction is the family. Children begin to learn during their early years in the family the attitudes and practices that will influence them throughout life. It becomes the function of the department of family life in this college to capitalize for family betterment certain contributions from home economics, sociology, psychology, education, medicine, and other fields; to organize these findings so that they may be readily usable by parents; and to carry these results to as many families as possible who can use them to improve their family life. Social interaction in the school, the community, and the nation cannot be depended upon to rise far above the level of social interaction in the families of the nation.

All courses in family life are intended to emphasize the family relationship aspect of home economics subject matter. Family relationships influence especially the behavior of young children. Because of this the nursery school is used extensively as a laboratory. Undergraduate courses deal with the various aspects of child development and parent education, in order to help students to understand child nature and to appreciate the influence that things and people have upon it. In the laboratory the point of reference is primarily and overtly the young child, for the influences of daily life are observable in process; in class discussion the student herself, past and present, is, more or less implicitly, the point of reference. An attempt is made to help the students apply their acquirements to more effective personal adjustments. This latter emphasis is most successfully developed through individual conferences supplementing the class work.

Advanced study prepares students for professional work with parents and children.

S 101. Principles in Behavior and Guidance (elementary course). Credit three hours. Prerequisite or parallel, Rural Education 116 (Psychology for Students of Child Guidance). Daily except S, 12. *Martha Van Rensselaer Hall 117*. Laboratory, one hour daily except S, by arrangement. *Nursery School*. Professor WYLIE and Miss REEVES.

This course concerns behavior, how it is influenced and how it influences others. It concerns behavior as routine, in eating, sleeping, dressing, toileting, bathing and washing; as adjustments and relationships with materials and with people; as developing control of language and of "nervous" and emotional behavior. The laboratory is the nursery school. The course is designed to help students see children in relation to the adults who guide them. It undertakes to direct the students to observe behavior impersonally and objectively; to record accurately what they see; to organize these records so that they disclose the significant and characteristic behavior; to distinguish between desirable and undesirable behavior and between desirable and undesirable guidance, and to apply the principles to themselves and their own behavior. Laboratory fee, \$7.50.

S 214. Studies in Child Development and Parent Education (short course). Credit two hours. M W F, 3-4:30. *Martha Van Rensselaer Hall 117*. Professors FOWLER and WARING.

Open to specialists in work with children and parents, to home economics supervisors who wish to form a group for the study and discussion of current activities in the field of child development and parent education, and to qualified lay leaders in parent education. Enrollment by permission of the instructor. Fee, \$1.50.

S 220. Participation in the Nursery School. Credit three or four hours. Prerequisite Family Life 101 (Principles in Child Guidance) and 107 (Environmental Factors in Child Guidance). *Nursery School*. Laboratory and conference hours to be arranged. Professor FOWLER and Miss REEVES.

This course is open only to a limited number of seniors and graduate students with qualifications satisfactory to the instructor. For each hour of credit, there is required a total of thirty hours of supervised participation with the children in the nursery school and several conferences each week with the teaching staff.

FOODS AND NUTRITION

Courses in foods and nutrition are designed to help students to understand problems of nutrition as these relate to the health and the welfare of the individual, the family, and the community; and to give them an opportunity to learn as individuals, teachers, extension workers, research workers, and mothers how to observe, to evaluate, and to meet these problems.

S 121. Food Selection: Nutrition and Dietetics. Credit two hours. For teachers and others who wish recent knowledge of the fundamentals of nutrition. Daily except S, 10. *Martha Van Rensselaer Hall 426*. Assistant Professor HAUCK.

A course designed to help students to understand the significance of the choice and use of food in achieving and maintaining health. Fee, \$1.50.

S 131. Problems of Family Nutrition with Special Emphasis on Child Feeding. Credit: Lectures and discussions, one hour; with laboratory, two hours. Prerequisite, a knowledge of general nutrition and dietetics obtained from previous college courses in these subjects. Lectures and discussions, M W F, 2. *Martha Van Rensselaer Hall 343*. Laboratory, infant and child feeding, T Th, 3-5. Laboratory is limited to twenty students. Professor MONSCH.

This is a study of family problems in nutrition, giving special emphasis to the nutritional needs of the child. The laboratory period offers opportunity for experience in actual family situations in homes of Ithaca. It also includes observation and experience in a well-baby clinic, the nursery school, the cafeteria, and the Ithaca Children's Home. The nutritional needs of children of all ages, the importance of proper feeding to the physical health of the child, and the relation between sound nutrition practice in feeding children and the community health and family income are considered. Laboratory fee, \$6; lecture fee, \$1.

S 228. Studies in Child Nutrition. Credit one hour. Open only to graduate students. Enrollment by permission of the instructor. Hours to be arranged. *Martha Van Rensselaer Hall 370.* Professor MONSCH.

This course is planned primarily for those graduate students majoring in child nutrition, who need individual or group conferences, readings, and discussions in the field of child nutrition preliminary to the working out of their theses.

S 230. Readings in Nutrition. Credit one or two hours. Open to seniors and graduate students specializing in nutrition. Readings on selected topics with class conferences, T Th, 11. Opportunity is given also for individual conferences. *Martha Van Rensselaer Hall 426.* Assistant Professor HAUCK. Fee, \$1.50.

TEXTILES AND CLOTHING

Courses in textiles and clothing are planned primarily for teachers who are reorganizing their homemaking programs in order to meet more satisfactorily the needs of their students and at the same time to make adjustments with changing school and community conditions. This reorganization requires new evaluations of purposes, analysis of course content to achieve the purposes, and finally, organization of content and teaching materials for use in specific situations.

S 217. Present-day Clothing Problems. Credit two hours. Designed for teachers and extension workers and for others who have had adequate preparation. Registration is limited to twenty students. Laboratory, daily except S, 11-1. *Martha Van Rensselaer Hall 215.* Assistant Professor SCOTT and Miss HUMPHREY.

In this course consideration is given to problems involved in reorganizing clothing programs to meet present teaching situations: the selection of problems to be presented in clothing classes; illustrative material for efficient presentation of different phases of clothing; a comparative study of different methods of adapting the subject matter of clothing to family and community needs. Clothing selection will be studied as a medium of self-expression. Clothing for children of different age groups in the community will be studied with opportunity for construction and remodeling. It is urged that every student planning to register for this course make an informal survey of the practical clothing needs of her community before coming to Ithaca, as well as have in mind the clothing problems of her particular teaching situation. Students will provide all materials subject to the approval of the instructor in charge. Estimated cost of materials, \$10. Laboratory fee, \$3.

S 255. Problems in Purchasing Household Textiles. Credit two hours. Especially for teachers and extension workers. Lecture, T Th, 11. Laboratory, M W F, 11-1. *Martha Van Rensselaer Hall 213.* Professor BLACKMORE.

This course is offered for students interested in the present-day problems of purchasing household textiles and for teachers and extension workers who wish to develop some phase of this work in their schools or communities. Concrete examples of buying practices are studied. Technical information necessary for efficient buying is considered. Labels and advertising claims for textiles are interpreted and evaluated. Opportunity will be given for personal conferences to consider methods of adapting the study of household textiles to specific situations. Estimated cost of materials, \$2. Laboratory fee, \$3.

HOUSEHOLD ART

See course S 246, Household Art in an Extension Program, on page 79.

ECONOMICS OF THE HOUSEHOLD AND HOUSEHOLD MANAGEMENT

The economic problems of families consist not only of those for which their own wise management can find solution, but also those which are so inter-related with factors outside the home that only group action can make progress toward their solution. The courses in this department therefore are planned not only to help individuals in the personal management of their resources, but also to assist them toward an understanding of the futility of the best individual efforts in the

face of certain outside forces, in order that they may become informed and motivated for effective group action toward the solution of economic problems affecting human welfare.

S 130. Family Incomes. Credit two hours. Daily except S, 12. *Martha Van Rensselaer Hall 124.* Professor CANON.

In this course, the size, adequacy, and security of family incomes in this country are studied, and the relation between income and human welfare is analyzed. This leads into examination of facts concerning the increasing importance of money in our economic society, the national income and its distribution, and the far-reaching effects of changes in the price level on the lives of individuals. Fee for materials, \$2.

See also course S 112, *Household Management as a Part of the Extension Program*, below.

A GROUP OF COURSES FOR EXTENSION WORKERS

The field of home economics extension has its own peculiar problems. For this reason a group of closely related courses is offered to aid extension workers in home economics in the study and solution of their problems.

Three of these courses deal with subject matter and one with program. In the three which deal with subject matter the purpose is three-fold: first, to develop in the student increased understanding of the specific field of subject matter covered; second, through the use of this subject matter to demonstrate effective methods of teaching and organization in extension; third, to relate the specific subject matter dealt with to a total home economics extension program. The fourth course is planned for study and discussion of the underlying principles of program making. While it is not essential that this fourth course be taken in all cases, it is believed that most satisfying results will be obtained if this course and at least one of the three subject matter extension courses be taken simultaneously.

In order to unify, to integrate, and to relate the experiences of students registering in one or more of these extension courses, a weekly discussion among all the students and all the staff in the four courses will be arranged.

S 104. Parent Groups in Extension. Credit two hours. Prerequisite or parallel Family Life 101 (Principles in Behavior and Guidance). For extension teachers. Lecture-discussions, daily except S, 11. *Martha Van Rensselaer Hall 117.* Extension Professor WYLIE.

Planned especially for those interested in working with parent groups in parental education and in child guidance. The purpose is to study problems of family relationships and to consider methods of organization and teaching by means of which extension teachers working with groups of parents may best help them in meeting their problems. The lecture-discussion, the club study plan, and the training and use of local leaders will be studied in connection with organized parent groups.

Throughout the course there will be opportunity for individual conferences and for participation with other extension classes to consider inter-relationships of subject matter as well as for consideration of significant changes in family and community life to be brought about through a program of home economics education. Fee, \$1.50.

S 112. Household Management as a Part of the Extension Program. Credit two hours. For extension workers and others by permission of the instructor. Discussion, M W, 10. *Martha Van Rensselaer Hall G-19A.* Laboratory, T Th, 2-5. *Martha Van Rensselaer Hall G-19.* Miss CUSHMAN.

The purposes of this course are: first, to help extension teachers determine how the methods of work in the home, the arrangement of work centers, the equipment and materials used, affect the time, energy, money, and satisfaction of the home maker, her family and the community; second, to help teachers to discover types of teaching activities by which homemakers may be brought to a consciousness of this relationship and by which they may improve unsatisfactory conditions; and third, to see how organizations outside the home, as well as the different phases of home economics teaching, may help to accomplish these aims. Kitchen and

factory tours, kitchen conferences, and other types of home, community, and laboratory demonstrations will be used to this end. Students will be given help in assembling illustrative material to meet their needs. A weekly meeting will be arranged with the students and staff of the other extension courses. In addition to fees there will be a nominal charge for transportation for field trips. Fee, \$2.50.

S 246. Household Art in an Extension Program. Credit two or four hours. Prerequisite, experience in extension work. Class limited to 15. For two hours' credit, discussion, T 10; laboratory, M W F, 2-5. Additional work as described below will carry two hours of additional credit. *Martha Van Rensselaer Hall* 327. Extension Assistant Professor WRIGHT.

This course gives opportunity for observation and practice in the use of local leaders in a project in room arrangement and room accessories. Experimentation in the arrangement of furnishings in living rooms will be used to demonstrate the possibility of developing art judgment in the individual through a final consensus of group judgment. The course should help students develop methods of analyzing local leader problems and of planning procedures so that the local leadership method of extension teaching may be effective in increasing the satisfaction and enjoyment of home life through the development of leaders and their communities. Demonstration classes will be held in Ithaca and in other places in Tompkins county, where students may both observe and teach the groups, thereby becoming more familiar with the skills and judgments which will be needed for local leader training in this project and with the illustrative material it will be necessary to assemble. Class discussion will include: (1) different ways in which local leadership may express itself; (2) how a project should be organized to lend itself to local leadership; (3) who should select local leaders; (4) how the qualifications for leaders should be determined; (5) how to train leaders; (6) how a continuing program of local leadership may be developed; (7) what part should be played in a local leader program by the agent, the specialist, the executive committee, the local committee, the leader, and the community. Illustrative material will be assembled by students for their own use in local leader training. Ten dollars should be allowed for this material. In addition to the fee there may be a nominal charge for transportation for field trips.

For those wishing four hours of credit special studies may be made of local leadership developments in other states, of other experimental work conducted in summer extension classes, and of plans developed for local leader training in this or other fields for student's own program of work. Fee, \$1.

S 286. Program Building in Home Economics Extension: A survey of some considerations significant in constructing an effective extension program in homemaking. Credit two to four hours. For two hours' credit, daily except S, 8. *Martha Van Rensselaer Hall* 117. For additional two hours' credit, hours to be arranged. Prerequisite, home economics extension experience. Miss HENDERSON.

This course is designed for extension workers who wish to reformulate for themselves bases for judging critically the effectiveness of homemaking extension programs in counties where they are working and to develop plans for correcting weaknesses where they exist. It will include a discussion of (1) ways to determine homemaking "needs", who should be served, and what information is needed about counties and communities; (2) how to use these data for constructing goals for an extension program; (3) the evaluating of goals and selecting of emphasis; (4) available studies of homemakers' "needs" and present extension programs in the light of such revealed "needs"; (5) the relation of "interests" to "needs", how "interests" develop, and how they may be guided towards "needs"; (6) when to work directly with homemakers and when and how to work through existing organizations; (7) bases for judging the effectiveness of certain extension procedures, characteristics of successful meetings, and organization and sequence within a "project".

Students interested in making a more intensive study of program building and in undertaking specific investigations of conditions and practices in their own counties to be used as bases for developing future programs may register for four hours. Registration for four hours should be made after consultation with the instructor. Fee, \$1.50.

SUMMER COURSES IN HOTEL ADMINISTRATION

HOWARD BAGNALL MEEK, M. A., in Charge
(Professor of Hotel Management)

In 1922 Cornell University established, with the cooperation and financial assistance of the American Hotel Association, a four-year course in Hotel Administration for high-school graduates desiring to enter the administrative departments of the hotel business. Many hotel proprietors and managers, who have been unable to take a four-year university course, have asked for shorter courses with less formal entrance requirements.

To meet this demand periods of less than six weeks have been arranged. For application blanks and information concerning the specific courses, applicants should write Professor H. B. Meek, Home Economics Building, Ithaca, New York.

REQUIREMENTS

Anyone employed in hotel work is eligible for admission. Prospective students will be required to present evidence of good character, of sincerity of purpose, and of interest in hotel work. It is distinctly to the advantage of prospective students to file applications early, in any event not later than June 15.

EXPENSES

The tuition fee for the unit courses is \$10 a week. There is a fee of \$1.50 for Willard Straight Hall. Laboratory fees are required in certain courses for supplies used.

For further general information, see pages 12 to 21.

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This series of pamphlets is designed to give prospective students and other persons information about Cornell University. No charge is made for the pamphlet unless a price is indicated after its name in the list below. Requests for pamphlets should be addressed to the Secretary of the University at Ithaca. *Money orders should be made payable to CORNELL UNIVERSITY.*

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Announcement of the Law School.

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Announcement of the Farm Study Courses.

Program of the Annual Farm and Home Week.

Announcement of the New York State College of Home Economics.

Announcement of the Course in Hotel Administration.

Announcement of the New York State Veterinary College.

Announcement of the Graduate School of Education.

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Announcement of the Summer Session.

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